LAKES

DC INVERTER VRF SYSTEM

SERVICE MANUAL

2011

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R-410A Heat Pump

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1. Introduction

1.1 Safety Cautions

Cautions and Warnings

■ Be sure to read the following safety cautions before conducting repair work.

■ The caution items are classified into "⚠ Warning" and "⚠ Caution" The "⚠ Warning" items are especially important since they can lead to death or serious injury if they are not followed closely. The "⚠ Caution" items can also lead to serious accidents under some conditions if they are not followed. Therefore, be sure to observe all the safety caution items described below.

■ About the pictograms

△ This symbol indicates an item for which caution must be exercised.

The pictogram shows the item to which attention must be paid.

○ This symbol indicates a prohibited action.

The prohibited item or action is shown inside or near the symbol.

● This symbol indicates an action that must be taken, or an instruction.

The instruction is shown inside or near the symbol.

■ After the repair work is complete, be sure to conduct a test operation to ensure that the equipment operates normally, and explain the cautions for operating the product to the customer

1.1.1 Caution in Repair

"⚠ Warning"	
Be sure to disconnect the power cable plug from the plug socket before disassembling the equipment for a repair. Working on the equipment that is connected to a power supply can cause an electrical shook. If it is necessary to supply power to the equipment to conduct the repair or inspecting the circuits, do not touch any electrically charged sections of the equipment.	
If the refrigerant gas discharges during the repair work, do not touch the discharging refrigerant gas. The refrigerant gas can cause frostbite.	
When disconnecting the suction or discharge pipe of the compressor at the welded section, release the refrigerant gas completely at a well-ventilated place first. If there is a gas remaining inside the compressor, the refrigerant gas or refrigerating machine oil discharges when the pipe is disconnected, and it can cause injury.	
If the refrigerant gas leaks during the repair work, ventilate the area. The refrigerant gas can generate toxic gases when it contacts flames.	
The step-up capacitor supplies high-voltage electricity to the electrical components of the outdoor unit. Be sure to discharge the capacitor completely before conducting repair work. A charged capacitor can cause an electrical shock.	
Do not start or stop the air conditioner operation by plugging or unplugging the power cable plug. Plugging or unplugging the power cable plug to operate the equipment can cause an electrical shock or fire.	
Do not repair the electrical components with wet hands. Working on the equipment with wet hands can cause an electrical shock.	
Do not clean the air conditioner by splashing water. Washing the unit with water can cause an electrical shock.	
Be sure to provide the grounding when repairing the equipment in a humid or wet place, to avoid electrical shocks	
Be sure to turn off the power switch and unplug the power cable when cleaning the equipment.The internal fan rotates at a high speed, and cause injury.	
Do not tilt the unit when removing it. The water inside the unit can spill and wet the furniture and floor.	
Be sure to check that the refrigerating cycle section has cooled down sufficiently before conducting repair work. Working on the unit when the refrigerating cycle section is hot can cause burns.	
Use the welder in a well-ventilated place. Using the welder in an enclosed room can cause oxygen deficiency.	

1.1.2 Cautions Regarding Products after Repair

"⚠ Warning"	
Be sure to use parts listed in the service parts list of the applicable model and appropriate tools to conduct repair work. Never attempt to modify the equipment. The use of inappropriate parts or tools can cause an electrical shock, excessive heat generation or fire.	
When relocating the equipment, make sure that the new installation site has sufficient strength to withstand the weight of the equipment. If the installation site does not have sufficient strength and if the installation work is not conducted securely, the equipment can fall and cause injury.	
Be sure to install the product correctly by using the provided standard installation frame. Incorrect use of the installation frame and improper installation can cause the equipment to fall, resulting in injury.	For integral units only
Be sure to install the product securely in the installation frame mounted on a window frame. If the unit is not securely mounted, it can fall and cause injury.	For integral units only
Be sure to use an exclusive power circuit for the equipment, and follow the technical standards related to the electrical equipment, the internal wiring regulations and the instruction manual for installation when conducting electrical work. Insufficient power circuit capacity and improper electrical work can cause an electrical shock or fire.	
Be sure to use the specified cable to connect between the indoor and outdoor units. Make the connections securely and route the cable properly so that there is no force pulling the cable at the connection terminals. Improper connections can cause excessive heat generation or fire.	
When connecting the cable between the indoor and outdoor units, make sure that the terminal cover does not lift off or dismount because of the cable. If the cover is not mounted properly, the terminal connection section can cause an electrical shock, excessive heat generation or fire.	
Do not damage or modify the power cable. Damaged or modified power cable can cause an electrical shock or fire. Placing heavy items on the power cable, and heating or pulling the power cable can damage the cable.	
Do not mix air or gas other than the specified refrigerant (R-410A) in the refrigerant system. If air enters the refrigerating system, an excessively high pressure results, causing equipment damage and injury.	
If the refrigerant gas leaks, be sure to locate the leak and repair it before charging the refrigerant. After charging refrigerant, make sure that there is no refrigerant leak. If the leak cannot be located and the repair work must be stopped, be sure to perform pump-down and close the service valve, to prevent the refrigerant gas from leaking into the room. The refrigerant gas itself is harmless, but it can generate toxic gases when it contacts flames, such as fan and other heaters, stoves and ranges.	
When replacing the coin battery in the remote controller, be sure to disposed of the old battery to prevent children from swallowing it.If a child swallows the coin battery, see a doctor immediately.	

Caution	
Installation of a leakage breaker is necessary in some cases depending on the conditions of the installation site, to prevent electrical shocks.	
Do not install the equipment in a place where there is a possibility of combustible gas leaks. If a combustible gas leaks and remains around the unit, it can cause a fire.	
Be sure to install the packing and seal on the installation frame properly. If the packing and seal are not installed properly, water can enter the room and wet the furniture and floor.	For integral units only

1.1.3 Inspection after Repair

"Warning"	
Check to make sure that the power cable plug is not dirty or loose, then insert the plug into a power outlet all the way. If the plug has dust or loose connection, it can cause an electrical shock or fire.	
If the power cable and lead wires have scratches or deteriorated, be sure to replace them. Damaged cable and wires can cause an electrical shock, excessive heat generation or fire.	
Do not use a joined power cable or extension cable, or share the same power outlet with other electrical appliances, since it can cause an electrical shock, excessive heat generation or fire.	

Caution	
Check to see if the parts and wires are mounted and connected properly, and if the connections at the soldered or crimped terminals are secure. Improper installation and connections can cause excessive heat generation, fire or an electrical shock.	
If the installation platform or frame has corroded, replace it. Corroded installation platform or frame can cause the unit to fall, resulting in injury	
Check the grounding, and repair it if the equipment is not properly grounded. Improper grounding can cause an electrical shock.	
Be sure to measure the insulation resistance after the repair, and make sure that the resistance is 1 Mohm or higher. Faulty insulation can cause an electrical shock.	
Be sure to check the drainage of the indoor unit after the repair. Faulty drainage can cause the water to enter the room and wet the furniture and floor.	

1.1.4 Using Icons

Icons are used to attract the attention of the reader to specific information. The meaning of each icon is described in the table below:

1.1.5 Using Icons List

Icon	Type of Information	Description
Note:	Note	A “note” provides information that is not indispensable, but may nevertheless be valuable to the reader, such as tips and tricks.
Caution	Caution	A “caution” is used when there is danger that the reader, through incorrect manipulation, may damage equipment, loose data, get an unexpected result or has to restart (part of) a procedure.
Warning	Warning	A “warning” is used when there is danger of personal injury.
	Reference	A “reference” guides the reader to other places in this binder or in this manual, where he/she will find additional information on a specific topic.

1.2 PREFACE

Thank you for your continued patronage of Chigo products.
We are confident that customers will be able to find the models that best suit their needs.
This service manual contains information regarding the servicing of VRV series Heat Pump S

Part 1
General Information

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1. Model Names of Indoor/Outdoor Units

Indoor unit

Power supply: 220V/1Ph/50Hz

Type	Model																	
		Capacity code																Structure code
Ceiling cassette	CMV-	22	28		36	45		56	71	80		100	112		125	140		Q
Low ESP duct		22	28	32	36	45		56	71	80	90	100	112		125	140	150	F1
Middle ESP duct									70	80	90	100		120			150	F2
High ESP duct									70	80	90	100		120			150	F3
Floor ceiling			28			45		56	71	80			112					LD
Wall-mounted		22	28		36	45	51		70									G

Outdoor unit

Power supply: 380V/3Ph/50Hz

system		Model						
Model	Module type	CMV-V	252	280				WSAM
					335	400	450	
	Single unit type		252	280				WSA
					335	400	450	
Combination model			532	560	615	680	735	WSAM
			785	850	900	960	1010	
			1065	1130	1180	1235	1300	
			1350					

2. External Appearance

2.1 Indoor Units

<table>
<tr>
<td>Compact type Ceiling cassette
CMV-22Q
CMV-28Q
CMV-36Q
CMV-45Q
CMV-56Q
 </td>
<td>Ceiling cassette
CMV-71Q
CMV-80Q
CMV-100Q
CMV-112Q
CMV-125Q
CMV-140Q
 </td>
</tr>
<tr>
<td>Low ESP duct
CMV-22F1 CMV-28F1
CMV-32F1 CMV-36F1
CMV-45F1 CMV-56F1
CMV-71F1 CMV-80F1
CMV-90F1 CMV-100F1
CMV-112F1 CMV-125F1
CMV-140F1 CMV-150F1
 </td>
<td>CMV-70F2 CMV-80F2
CMV-90F2 CMV-100F2
CMV-120F2 CMV-150F2

CMV-70F3 CMV-80F3
CMV-90F3 CMV-100F3
CMV-120F3 CMV-150F3</td>
</tr>
<tr>
<td>CMV-45LD
CMV-56LD
CMV-71LD
CMV-80LD
CMV-112LD
 </td>
<td>CMV-22G(V84)
CMV-28G(V84)
CMV-36G(M84)
CMV-45G(P84)
CMV-51G(P84)
CMV-70G(W84)
 </td>
</tr>
</table>

2.2 Outdoor Units

<table>
<tr>
<td>8HP: CMV-V252WSA(M)
10HP: CMV-V280WSA(M)
 </td>
<td>12 HP: CMV-V335WSA(M)
14 HP: CMV-V400WSA(M)
16 HP: CMV-V450WSA(M)
 </td>
</tr>
</table>

18 HP ： CMV-V532WSAM
20 HP ： CMV-V560 WSAM

22 HP ： CMV-V615WSAM
24 HP ： CMV-V680WSAM
26 HP ： CMV-V735WSAM

28 HP ： CMV-V780WSAM
30 HP ： CMV-V850WSAM
32 HP ： CMV-V900WSAM

34 HP ： CMV-V960WSAM
36 HP ： CMV-V1010WSAM

38 HP：CMV-V1065WSAM
40 HP： CMV-V1130WSAM
42 HP： CMV-V1180WSAM

44 HP ： CMV-V1235WSAM
46 HP ： CMV-V1300WSAM
48 HP ： CMV-V1350WSAM

3. Model Selection

Connectable Indoor Units Number and Capacity

System name		CMV-V252WSA(M)	CMV-V280WSA(M)	CMV-V335WSA(M)
Capacity	kW	25.2	28	33.5
	HP	8	10	12
Outdoor unit 1 (master modular)		CMV-V252WM6A(/M)	CMV-V280WM6A(/M)	CMV-V330WN6A(/M)
Outdoor unit 2		——	——	——
Outdoor unit 3		——	——	——
Total number of connectable indoor units		12	14	16
Total Capacity Index of Indoor Units to be Connected	kW	12.6～27.7	14.0～30.8	16.5～36.3

System name		CMV-V400WSA(M)	CMV-V450WSA(M)	CMV-V532WSAM
Capacity	kW	40	45	53.2
	HP	14	16	18
Outdoor unit 1 (master modular)		CMV-V400WN6A(/M)	CMV-V450WN6A(/M)	CMV-V280WM6A/M
Outdoor unit 2		——	——	CMV-V252WM6A/M
Outdoor unit 3		——	——	——
Total number of connectable indoor units		20	22	26
Total Capacity Index of Indoor Units to be Connected	kW	20.0～44.0	22.5～49.5	26.6～58.5

System name		CMV-V560WSAM	CMV-V615WSAM	CMV-V680WSAM
Capacity	kW	56	61.5	68
	HP	20	22	24
Outdoor unit 1 (master modular)		CMV-V280WM6A/M	CMV-V330WN6A/M	CMV-V400WN6A/M
Outdoor unit 2		CMV-V280WM6A/M	CMV-V280WM6A/M	CMV-V280WM6A/M
Outdoor unit 3		——	——	——
Total number of connectable indoor units		28	30	34
Total Capacity Index of Indoor Units to be Connected	kW	28.0～61.6	30.5～67.1	34.0～74.8

System name		CMV-V735WSAM	CMV-V780WSAM	CMV-V850WSAM
Capacity	kW	73.5	78	85
	HP	26	28	30
Outdoor unit 1 (master modular)		CMV-V450WN6A/M	CMV-V450WN6A/M	CMV-V450WN6A/M
Outdoor unit 2		CMV-V280WM6A/M	CMV-V330WN6A/M	CMV-V400WN6A/M
Outdoor unit 3		——	——	——
Total number of connectable indoor units		36	39	42
Total Capacity Index of Indoor Units to be Connected	kW	36.5～80.3	39.0～85.8	42.5～93.5

System name		CMV-V900WSAM	CMV-V960WSAM	CMV-V1010WSAM
Capacity	kW	90	96	101
	HP	32	34	36
Outdoor unit 1 (master modular)		CMV-V450WN6A/M	CMV-V400WN6A/M	CMV-V450WN6A/M
Outdoor unit 2		CMV-V450WN6A/M	CMV-V280WM6A/M	CMV-V280WM6A/M
Outdoor unit 3		——	CMV-V280WM6A/M	CMV-V280WM6A/M
Total number of connectable indoor units		45	48	50
Total Capacity Index of Indoor Units to be Connected	kW	45.0～99.0	48.0～105.6	50.5～111.1

System name		CMV-V1065WSAM	CMV-V1130WSAM	CMV-V1180WSAM
Capacity	kW	106.5	113	118
	HP	38	40	42
Outdoor unit 1 (master modular)		CMV-V450WN6A/M	CMV-V450WN6A/M	CMV-V450WN6A/M
Outdoor unit 2		CMV-V330WN6A/M	CMV-V400WN6A/M	CMV-V450WN6A/M
Outdoor unit 3		CMV-V280WM6A/M	CMV-V280WM6A/M	CMV-V280WM6A/M
Total number of connectable indoor units		50	50	50
Total Capacity Index of Indoor Units to be Connected	kW	53.0～116.6	56.5～124.3	59.0～129.8

System name		CMV-V1235WSAM	CMV-V1300WSAM	CMV-V1350WSAM
Capacity	kW	123.5	130	135
	HP	44	46	48
Outdoor unit 1 (master modular)		CMV-V450WN6A/M	CMV-V450WN6A/M	CMV-V450WN6A/M
Outdoor unit 2		CMV-V450WN6A/M	CMV-V450WN6A/M	CMV-V450WN6A/M
Outdoor unit 3		CMV-V330WN6A/M	CMV-V400WN6A/M	CMV-V450WN6A/M
Total number of connectable indoor units		50	50	50
Total Capacity Index of Indoor Units to be Connected	kW	61.5～135.3	65.0～143.0	67.5～148.5

Connectable Indoor Unit

Type	Model																
		Capacity code															Structure code
Ceiling cassette	CMV-	22	28		36	45		56	71	80		100	112		125	140		Q
Low ESP duct		22	28	32	36	45		56	71	80	90	100	112		125	140	150	F1
Middle ESP duct									70	80	90	100		120			150	F2
High ESP duct									70	80	90	100		120			150	F3
Floor ceiling			28			45		56	71	80			112					LD
Wall-mounted		22	28		36	45	51		70									G

Indoor Unit Capacity

Indoor capacity	18/22	25/28	32/36	45/46	51/56	70/71/80	88/90	100
kW	1.8/2.2	2.5/2.8	3.2/3.6	4.5/4.6	5.1/5.6	7.0/7.1/8.0	8.8/9.0	10.0
HP	0.8	1	1.5	1.7	2	3	3.5	4
Indoor capacity	112	120/125	140	150	170	200	224	250
kW	11.2	12.0/12.5	14.0	15.0	17.0	20.0	22.4	25.0
HP	4.5	5	5.5	6	7	8	9	10

Use the above tables to determine the capacities of indoor units to be connected. Make sure the total capacity of indoor units connected to each outdoor unit is within the specified value (kW).

■ The total capacity of connected indoor units must be within a range of 50 to 120% of the rated capacity of the outdoor unit.

■ In some models, it is not possible to connect the maximum number of connectable indoor units. Select models so the total capacity of connected indoor units conforms to the specification.

Part 2
Specification

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1. Specifications

1.1 Outdoor Units

Model Name			CMV-V252WSA	CMV-V280WSA
★1 Cooling Capacity		kW	25.2	28.0
★2 Heating Capacity		kW	27.4	31.5
Casing Color			camel gray	camel gray
Dimensions: (H×W×D)		mm	1665×930×765	1665×930×765
Heat Exchanger			Hydrophilic Aluminum	Hydrophilic Aluminum
Comp.	Type		Scroll Compressor	Scroll Compressor
	Piston Displacement	cm3/rev	38+49	38+49
	Number of Revolutions	rpm	30～62	30～78
	Motor Input × Number of Units	kW	(3.88＋4.27)×1	(3.88＋4.27)×1
	Starting Method		soft start	soft start
Fan	Type		Axial fan	Axial fan
	Motor Output	kW	0.550×1	0.550×1
	Air Flow Rate	m3/h	11000	11000
	Drive		Variable frequency drive	Variable frequency drive
Connecting Pipes	Liquid Pipe	mm	φ12.7	φ12.7
	Gas Pipe	mm	φ22	φ22
Machine Weight (Mass)		kg	290	290
★3 Sound Level (Reference Value)		dB(A)	58	58
Safety Devices			high pressure switch、fan drive overload protector、Over-current relay、Inverter overload protector	high pressure switch、fan drive overload protector、Over-current relay、Inverter overload protector
Capacity Control		%	15～110	15～110
Refrigerant	Refrigerant Name		R-410A	R-410A
	Charge	kg	12.5	12.5
	Control		Electronic Expansion Valve	Electronic Expansion Valve
Refrigerator Oil			FVC68D	FVC68D
	Charge Volume	l	4	4
Standard Accessories			Instruction	Instruction

Model Name			CMV-V335WSA	CMV-V400WSA
★1 Cooling Capacity		kW	33.5	40
★2 Heating Capacity		kW	37.5	45
Casing Color			camel gray	camel gray
Dimensions: (H×W×D)		mm	1645×1340×765	1645×1340×765
Heat Exchanger			Hydrophilic Aluminum	Hydrophilic Aluminum
Comp.	Type		Scroll Compressor	Scroll Compressor
	Piston Displacement	cm3/rev	38+59	38+49+49
	Number of Revolutions	rpm	30～78	30～78
	Motor Input × Number of Units	kW	(3.88＋5.13)×1	(3.88＋4.27＋4.27)×1
	Starting Method		soft start	soft start
Fan	Type		Axial fan	Axial fan
	Motor Output	kW	0.400×2	0.400×2
	Air Flow Rate	m3/h	14000	16000
	Drive		Variable frequency drive	Variable frequency drive
Connecting Pipes	Liquid Pipe	mm	φ12.7	φ15.88
	Gas Pipe	mm	φ22	φ28.6
Machine Weight (Mass)		kg	365	420
★3 Sound Level (Reference Value)		dB(A)	58	60
Safety Devices			high pressure switch、fan drive overload protector、Over-current relay、Inverter overload protector	high pressure switch、fan drive overload protector、Over-current relay、Inverter overload protector
Capacity Control		%	15～110	15～110
Refrigerant	Refrigerant Name		R-410A	R-410A
	Charge	kg	14	17
	Control		Electronic Expansion Valve	Electronic Expansion Valve
Refrigerator Oil			FVC68D	FVC68D
	Charge Volume	l	4	6
Standard Accessories			Instruction	Instruction

Model Name			CMV-V450WSA
★1 Cooling Capacity		kW	45
★2 Heating Capacity		kW	50
Casing Color			camel gray
Dimensions: (H×W×D)		mm	1645×1340×765
Heat Exchanger			Hydrophilic Aluminum
Comp.	Type		Scroll Compressor
	Piston Displacement	cm3/rev	38+59+59
	Number of Revolutions	rpm	30～78
	Motor Input × Number of Units	kW	(3.88＋5.13＋5.13)×1
	Starting Method		soft start
Fan	Type		Axial fan
	Motor Output	kW	0.400×2
	Air Flow Rate	m3/h	16000
	Drive		Variable frequency drive
Connecting Pipes	Liquid Pipe	mm	φ15.88
	Gas Pipe	mm	φ28.6
Machine Weight (Mass)		kg	420
★3 Sound Level (Reference Value)		dB(A)	60
Safety Devices			high pressure switch、fan drive overload protector、Over-current relay、Inverter overload protector
Capacity Control		%	15～110
Refrigerant	Refrigerant Name		R-410A
	Charge	kg	18.2
	Control		Electronic Expansion Valve
Refrigerator Oil			FVC68D
	Charge Volume	l	6
Standard Accessories			Instruction

Notes: ★ 1 Indoor temp. : 80°FDB or 67°FWB / outdoor temp. : 95°FDB / Equivalent piping length : 25 ft, level difference: 0.

★ 2 Indoor temp. : 70°FDB / outdoor temp. : 47°FDB or 43°FWB / Equivalent piping length : 25 ft, level difference: 0.

★ 3 Anechoic chamber conversion values, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of ambient conditions.

Model Name (Combination Unit)			CMV-V252WSAM	CMV-V280WSAM
Model Name (Independent Unit)			CMV-V252WSAM	CMV-V280WSAM
★1 Cooling Capacity			25.2	28.0
★2 Heating Capacity			27.4	31.5
Casing Color			camel gray	camel gray
Dimensions: (H×W×D)		mm	1665×930×765	1665×930×765
Heat Exchanger			Hydrophilic Aluminum	Hydrophilic Aluminum
Comp.	Type		Scroll Compressor	Scroll Compressor
	Piston Displacement	cm3/rev	38+49	38+49
	Number of Revolution	rpm	30～62	30～78
	Motor Input × Number of Units	kW	(3.88＋4.27)×1	(3.88＋4.27)×1
	Starting Method		Soft start-up	Soft start-up
Fan	Type		Axial flow fan	Axial flow fan
	Motor Output	kW	0.550×1	0.550×1
	Air Flow Rate	m3/h	11000	11000×1
	Drive		Variable frequency drive	Variable frequency drive
Connecting Pipes	Liquid Pipe ★3	mm	φ12.7	φ12.7
	Gas Pipe ★3	mm	φ22	φ22
	Oil Equalizing Pipe	mm	φ6.35	φ6.35
Machine Weight (Mass)		kg	290	290
Safety Devices			high pressure switch、fan drive overload protector、Over-current relay、Inverter overload protector	high pressure switch、fan drive overload protector、Over-current relay、Inverter overload protector
Defrost Method			Automatic intelligent defrosting	Automatic intelligent defrosting
Capacity Control		%	15～110	15～110
Refrigerant	Refrigerant Name		R-410A	R-410A
	Charge	kg	12.5	12.5
	Control		Electronic Expansion Valve	Electronic Expansion Valve
Refrigerator Oil			FVC68D	FVC68D
	Charge Volume	l	4	4
Standard Accessories			manual	manual

Model Name (Combination Unit)			CMV-V335WSAM	CMV-V400WSAM
Model Name (Independent Unit)			CMV-V335WSAM	CMV-V400WSAM
★1 Cooling Capacity			33.5	40
★2 Heating Capacity			37.5	45
Casing Color			camel gray	camel gray
Dimensions: (H×W×D)		mm	1645×1340×765	1645×1340×765
Heat Exchanger			Hydrophilic Aluminum	Hydrophilic Aluminum
Comp.	Type		Scroll Compressor	Scroll Compressor
	Piston Displacement	cm3/rev	38+59	38+49+49
	Number of Revolution	rpm	30～78	30～78
	Motor Input × Number of Units	kW	(3.88＋5.13)×1	(3.88＋4.27＋4.27)×1
	Starting Method		Soft start-up	Soft start-up
Fan	Type		Axial flow fan	Axial flow fan
	Motor Output	kW	0.400×2	0.400×2
	Air Flow Rate	m3/h	14000×1	16000×1
	Drive		Variable frequency drive	Variable frequency drive
Connecting Pipes	Liquid Pipe ★3	mm	φ12.7	φ15.88
	Gas Pipe ★3	mm	φ22	φ28.6
	Oil Equalizing Pipe	mm	φ6.35	φ6.35
Machine Weight (Mass)		kg	365	420
Safety Devices			high pressure switch、fan drive overload protector、Over-current relay、Inverter overload protector	high pressure switch、fan drive overload protector、Over-current relay、Inverter overload protector
Defrost Method			Automatic intelligent defrosting	Automatic intelligent defrosting
Capacity Control		%	15～110	15～110
Refrigerant	Refrigerant Name		R-410A	R-410A
	Charge	kg	14	17
	Control		Electronic Expansion Valve	Electronic Expansion Valve
Refrigerator Oil			FVC68D	FVC68D
	Charge Volume	l	4	6
Standard Accessories			manual	manual

Model Name (Combination Unit)			CMV-V450WSAM	CMV-V532WSAM
Model Name (Independent Unit)			CMV-V450WSAM	CMV-V252WSAM+CMV-V280WSAM
★1 Cooling Capacity			45	53.2
★2 Heating Capacity			50	58.9
Casing Color			camel gray	camel gray
Dimensions: (H×W×D)		mm	1645×1340×765	(1665×930×765)+(1665×930×765)
Heat Exchanger			Hydrophilic Aluminum	Hydrophilic Aluminum
Comp.	Type		Scroll Compressor	Scroll Compressor
	Piston Displacement	cm3/rev	38+59+59	(38+49)×2
	Number of Revolution	rpm	30～78	(30～62)＋(30～78)
	Motor Input × Number of Units	kW	(3.88＋5.13＋5.13)×1	(3.88＋4.27)×2
	Starting Method		Soft start-up	Soft start-up
Fan	Type		Axial flow fan	Axial flow fan
	Motor Output	kW	0.400×2	0.550×2
	Air Flow Rate	m3/h	16000×1	11000×2
	Drive		Variable frequency drive	Variable frequency drive
Connecting Pipes	Liquid Pipe ★3	mm	φ15.88	φ19.1(Brazing Connection)
	Gas Pipe ★3	mm	φ28.6	φ34.9(Brazing Connection)
	Oil Equalizing Pipe	mm	φ6.35	φ6.35
Machine Weight (Mass)		kg	420	290+290
Safety Devices			high pressure switch、fan drive overload protector、Over-current relay、Inverter overload protector	high pressure switch、fan drive overload protector、Over-current relay、Inverter overload protector
Defrost Method			Automatic intelligent defrosting	Automatic intelligent defrosting
Capacity Control		%	15～110	15～110
Refrigerant	Refrigerant Name		R-410A	R-410A
	Charge	kg	18.2	12.5+12.5
	Control		Electronic Expansion Valve	Electronic Expansion Valve
Refrigerator Oil			FVC68D	FVC68D
	Charge Volume	l	6	4+4
Standard Accessories			manual	manual

Model Name (Combination Unit)			CMV-V560WSAM	CMV-V615WSAM
Model Name (Independent Unit)			CMV-V280WSAM+CMV-V280WSAM	CMV-V280WSAM+CMV-V335WSAM
★1 Cooling Capacity			56	61.5
★2 Heating Capacity			63	69
Casing Color			camel gray	camel gray
Dimensions: (H×W×D)		mm	(1665×930×765)+(1665×930×765)	(1665×930×765)+(1645×1340×765)
Heat Exchanger			Hydrophilic Aluminum	Hydrophilic Aluminum
Comp.	Type		Scroll Compressor	Scroll Compressor
	Piston Displacement	cm3/rev	(38+49)×2	(38+49)+(38+59)
	Number of Revolution	rpm	(30～78)×2	(30～78)×2
	Motor Input × Number of Units	kW	(3.88＋4.27)×2	(3.88＋4.27)×1 ＋(3.88＋5.13)×1
	Starting Method		Soft start-up	Soft start-up
Fan	Type		Axial flow fan	Axial flow fan
	Motor Output	kW	0.550×2	0.550×1+0.400×2
	Air Flow Rate	m3/h	11000×2	11000×1+14000×1
	Drive		Variable frequency drive	Variable frequency drive
Connecting Pipes	Liquid Pipe ★3	mm	φ19.1(Brazing Connection)	φ19.1(Brazing Connection)
	Gas Pipe ★3	mm	φ34.9(Brazing Connection)	φ34.9(Brazing Connection)
	Oil Equalizing Pipe	mm	φ6.35	φ6.35
Machine Weight (Mass)		kg	290+290	290+365
Safety Devices			high pressure switch、fan drive overload protector、Over-current relay、Inverter overload protector	high pressure switch、fan drive overload protector、Over-current relay、Inverter overload protector
Defrost Method			Automatic intelligent defrosting	Automatic intelligent defrosting
Capacity Control		%	15～110	15～110
Refrigerant	Refrigerant Name		R-410A	R-410A
	Charge	kg	12.5+12.5	12.5+14
	Control		Electronic Expansion Valve	Electronic Expansion Valve
Refrigerator Oil			FVC68D	FVC68D
	Charge Volume	l	4+4	4+4
Standard Accessories			manual	manual

Model Name (Combination Unit)			CMV-V680WSAM	CMV-V730WSAM
Model Name (Independent Unit)			CMV-V280WSAM+CMV-V400WSAM	CMV-V280WSAM+CMV-V450WSAM
★1 Cooling Capacity			68	73
★2 Heating Capacity			76.5	81.5
Casing Color			camel gray	camel gray
Dimensions: (H×W×D)		mm	(1665×930×765)+(1645×1340×765)	(1665×930×765)+(1645×1340×765)
Heat Exchanger			Hydrophilic Aluminum	Hydrophilic Aluminum
Comp.	Type		Scroll Compressor	Scroll Compressor
	Piston Displacement	cm3/rev	(38+49)+(38+49+49)	(38+49)+(38+59+59)
	Number of Revolution	rpm	(30～78)×2	(30～78)×2
	Motor Input × Number of Units	kW	(3.88＋4.27)×1＋(3.88＋4.27＋4.27)×1	(3.88＋4.27)×1＋(3.88＋5.13＋5.13)×1
	Starting Method		Soft start-up	Soft start-up
Fan	Type		Axial flow fan	Axial flow fan
	Motor Output	kW	0.550×1+0.400×2	0.550×1+0.400×2
	Air Flow Rate	m3/h	11000×1+16000×1	11000×1+16000×1
	Drive		Variable frequency drive	Variable frequency drive
Connecting Pipes	Liquid Pipe ★3	mm	φ19.1(Brazing Connection)	φ22.2(Brazing Connection)
	Gas Pipe ★3	mm	φ34.9(Brazing Connection)	φ38.1(Brazing Connection)
	Oil Equalizing Pipe	mm	φ6.35	φ6.35
Machine Weight (Mass)		kg	290+420	290+420
Safety Devices			high pressure switch、fan drive overload protector、Over-current relay、Inverter overload protector	high pressure switch、fan drive overload protector、Over-current relay、Inverter overload protector
Defrost Method			Automatic intelligent defrosting	Automatic intelligent defrosting
Capacity Control		%	15～110	15～110
Refrigerant	Refrigerant Name		R-410A	R-410A
	Charge	kg	12.5+17	12.5+18.2
	Control		Electronic Expansion Valve	Electronic Expansion Valve
Refrigerator Oil			FVC68D	FVC68D
	Charge Volume	l	4+6	4+6
Standard Accessories			manual	manual

Model Name (Combination Unit)			CMV-V785WSAM	CMV-V850WSAM
Model Name (Independent Unit)			CMV-V335WSAM+CMV-V450WSAM	CMV-V400WSAM+CMV-V450WSAM
★1 Cooling Capacity			78.5	85
★2 Heating Capacity			87.5	95
Casing Color			camel gray	camel gray
Dimensions: (H×W×D)		mm	(1645×1340×765)+(1645×1340×765)	(1645×1340×765)+(1645×1340×765)
Heat Exchanger			Hydrophilic Aluminum	Hydrophilic Aluminum
Comp.	Type		Scroll Compressor	Scroll Compressor
	Piston Displacement	cm3/rev	(38+59)+(38+59+59)	(38+49+49)+(38+59+59)
	Number of Revolution	rpm	(30～78)×2	(30～78)×2
	Motor Input × Number of Units	kW	(3.88＋5.13)×1＋(3.88＋5.13＋5.13)×1	(3.88＋4.27+4.27)×1＋(3.88＋5.13＋5.13)×1
	Starting Method		Soft start-up	Soft start-up
Fan	Type		Axial flow fan	Axial flow fan
	Motor Output	kW	0.400×4	0.400×4
	Air Flow Rate	m3/h	14000×1+16000×1	16000×2
	Drive		Variable frequency drive	Variable frequency drive
Connecting Pipes	Liquid Pipe ★3	mm	φ22.2(Brazing Connection)	φ22.2(Brazing Connection)
	Gas Pipe ★3	mm	φ38.1(Brazing Connection)	φ38.1(Brazing Connection)
	Oil Equalizing Pipe	mm	φ6.35	φ6.35
Machine Weight (Mass)		kg	365+420	420+420
Safety Devices			high pressure switch、fan drive overload protector、Over-current relay、Inverter overload protector	high pressure switch、fan drive overload protector、Over-current relay、Inverter overload protector
Defrost Method			Automatic intelligent defrosting	Automatic intelligent defrosting
Capacity Control		%	15～110	15～110
Refrigerant	Refrigerant Name		R-410A	R-410A
	Charge	kg	14+18.2	17+18.2
	Control		Electronic Expansion Valve	Electronic Expansion Valve
Refrigerator Oil			FVC68D	FVC68D
	Charge Volume	l	4+6	6+6
Standard Accessories			manual	manual

Model Name (Combination Unit)			CMV-V900WSAM	CMV-V960WSAM
Model Name (Independent Unit)			CMV-V450WSAM+CMV-V450WSAM	CMV-V280WSAM+CMV-V280WSAM+CMV-V400WSAM
★1 Cooling Capacity			90	96
★2 Heating Capacity			100	108
Casing Color			camel gray	camel gray
Dimensions: (H×W×D)		mm	(1645×1340×765)+(1645×1340×765)	(1665×930×765)×2+(1645×1340×765)
Heat Exchanger			Hydrophilic Aluminum	Hydrophilic Aluminum
Comp.	Type		Scroll Compressor	Scroll Compressor
	Piston Displacement	cm3/rev	(38+59+59)+(38+59+59)	(38+49)×2+(38+49+49)
	Number of Revolution	rpm	(30～78)×2	(30～78)×3
	Motor Input × Number of Units	kW	(3.88＋5.13＋5.13)×2	(3.88＋4.27)×2＋(3.88＋4.27＋4.27)×1
	Starting Method		Soft start-up	Soft start-up
Fan	Type		Axial flow fan	Axial flow fan
	Motor Output	kW	0.400×4	0.550×2+0.400×2
	Air Flow Rate	m3/h	16000×2	11000×2+16000×1
	Drive		Variable frequency drive	Variable frequency drive
Connecting Pipes	Liquid Pipe ★3	mm	φ22.2(Brazing Connection)	φ22.2(Brazing Connection)
	Gas Pipe ★3	mm	φ38.1(Brazing Connection)	φ41.3(Brazing Connection)
	Oil Equalizing Pipe	mm	φ6.35	φ6.35
Machine Weight (Mass)		kg	420+420	290+290+420
Safety Devices			high pressure switch、fan drive overload protector、Over-current relay、Inverter overload protector	high pressure switch、fan drive overload protector、Over-current relay、Inverter overload protector
Defrost Method			Automatic intelligent defrosting	Automatic intelligent defrosting
Capacity Control		%	15～110	15～110
Refrigerant	Refrigerant Name		R-410A	R-410A
	Charge	kg	18.2+18.2	12.5+12.5+17
	Control		Electronic Expansion Valve	Electronic Expansion Valve
Refrigerator Oil			FVC68D	FVC68D
	Charge Volume	l	6+6	4+4+6
Standard Accessories			manual	manual

Model Name (Combination Unit)			CMV-V1010WSAM	CMV-V1065WSAM
Model Name (Independent Unit)			CMV-V280WSAM+CMV-V280WSAM+CMV-V450WSAM	CMV-V280WSAM+CMV-V335WSAM+CMV-V450WSAM
★1 Cooling Capacity			101	106.5
★2 Heating Capacity			113	119
Casing Color			camel gray	camel gray
Dimensions: (H×W×D)		mm	(1665×930×765)×2+(1645×1340×765)	(1665×930×765)+(1645×1340×765)×2
Heat Exchanger			Hydrophilic Aluminum	Hydrophilic Aluminum
Comp.	Type		Scroll Compressor	Scroll Compressor
	Piston Displacement	cm3/rev	(38+49)×2+(38+59+59)	(38+49)+(38+59)+(38+59+59)
	Number of Revolution	rpm	(30～78)×3	(30～78)×3
	Motor Input × Number of Units	kW	(3.88＋4.27)×2＋(3.88＋5.13＋5.13)×1	(3.88＋4.27)×1＋(3.88+5.13)×1 +(3.88＋5.13＋5.13)×1
	Starting Method		Soft start-up	Soft start-up
Fan	Type		Axial flow fan	Axial flow fan
	Motor Output	kW	0.550×2+0.400×2	0.550×1+0.400×4
	Air Flow Rate	m3/h	11000×2+16000×1	11000×1+14000×1+16000×1
	Drive		Variable frequency drive	Variable frequency drive
Connecting Pipes	Liquid Pipe ★3	mm	φ22.2(Brazing Connection)	φ22.2(Brazing Connection)
	Gas Pipe ★3	mm	φ41.3(Brazing Connection)	φ41.3(Brazing Connection)
	Oil Equalizing Pipe	mm	φ6.35	φ6.35
Machine Weight (Mass)		kg	290+290+420	290+365+420
Safety Devices			high pressure switch、fan drive overload protector、Over-current relay、Inverter overload protector	high pressure switch、fan drive overload protector、Over-current relay、Inverter overload protector
Defrost Method			Automatic intelligent defrosting	Automatic intelligent defrosting
Capacity Control		%	15～110	15～110
Refrigerant	Refrigerant Name		R-410A	R-410A
	Charge	kg	12.5+12.5+18.2	12.5+14+18.2
	Control		Electronic Expansion Valve	Electronic Expansion Valve
Refrigerator Oil			FVC68D	FVC68D
	Charge Volume	l	4+4+6	4+4+6
Standard Accessories			manual	manual

Model Name (Combination Unit)			CMV-V1130WSAM	CMV-V1180WSAM
Model Name (Independent Unit)			CMV-V280WSAM+CMV-V400WSAM+CMV-V450WSAM	CMV-V280WSAM+CMV-V450WSAM+CMV-V450WSAM
★1 Cooling Capacity			113	118
★2 Heating Capacity			126.5	131.5
Casing Color			camel gray	camel gray
Dimensions: (H×W×D)		mm	(1665×930×765)+(1645×1340×765)×2	(1665×930×765)+(1645×1340×765)×2
Heat Exchanger			Hydrophilic Aluminum	Hydrophilic Aluminum
Comp.	Type		Scroll Compressor	Scroll Compressor
	Piston Displacement	cm3/rev	(38+49)+(38+49+49)+(38+59+59)	(38+49)+(38+59+59)×2
	Number of Revolution	rpm	(30～78)×3	(30～78)×3
	Motor Input × Number of Units	kW	(3.88＋4.27)×1＋(3.88＋4.27＋4.27)×1 +(3.88＋5.13＋5.13)×1	(3.88＋4.27)×1＋(3.88＋5.13＋5.13)×2
	Starting Method		Soft start-up	Soft start-up
Fan	Type		Axial flow fan	Axial flow fan
	Motor Output	kW	0.550×1+0.400×4	0.550×1+0.400×4
	Air Flow Rate	m3/h	11000×1+16000×2	11000×1+16000×2
	Drive		Variable frequency drive	Variable frequency drive
Connecting Pipes	Liquid Pipe ★3	mm	φ22.2(Brazing Connection)	φ22.2(Brazing Connection)
	Gas Pipe ★3	mm	φ41.3(Brazing Connection)	φ41.3(Brazing Connection)
	Oil Equalizing Pipe	mm	φ6.35	φ6.35
Machine Weight (Mass)		kg	290+420+420	290+420+420
Safety Devices			high pressure switch、fan drive overload protector、Over-current relay、Inverter overload protector	high pressure switch、fan drive overload protector、Over-current relay、Inverter overload protector
Defrost Method			Automatic intelligent defrosting	Automatic intelligent defrosting
Capacity Control		%	15～110	15～110
Refrigerant	Refrigerant Name		R-410A	R-410A
	Charge	kg	12.5+17+18.2	12.5+18.2+18.2
	Control		Electronic Expansion Valve	Electronic Expansion Valve
Refrigerator Oil			FVC68D	FVC68D
	Charge Volume	l	4+6+6	4+6+6
Standard Accessories			manual	manual

Model Name (Combination Unit)			CMV-V1235WSAM	CMV-V1300WSAM
Model Name (Independent Unit)			CMV-V335WSAM+CMV-V450WSAM +CMV-V450WSAM	CMV-V400WSAM+CMV-V450WSAM +CMV-V450WSAM
★1 Cooling Capacity			123.5	130
★2 Heating Capacity			137.5	145
Casing Color			camel gray	camel gray
Dimensions: (H×W×D)		mm	(1645×1340×765)×3	(1645×1340×765)×3
Heat Exchanger			Hydrophilic Aluminum	Hydrophilic Aluminum
Comp.	Type		Scroll Compressor	Scroll Compressor
	Piston Displacement	cm3/rev	(38+59)+(38+59+59)×2	(38+49+49)+(38+59+59)×2
	Number of Revolution	rpm	(30～78)×3	(30～78)×3
	Motor Input × Number of Units	kW	(3.88＋5.13)×1＋(3.88＋5.13＋5.13)×2	(3.88＋4.27＋4.27)×1+(3.88＋5.13＋5.13)×2
	Starting Method		Soft start-up	Soft start-up
Fan	Type		Axial flow fan	Axial flow fan
	Motor Output	kW	0.400×6	0.400×6
	Air Flow Rate	m3/h	14000+16000×2	16000×3
	Drive		Variable frequency drive	Variable frequency drive
Connecting Pipes	Liquid Pipe ★3	mm	φ22.2(Brazing Connection)	φ22.2(Brazing Connection)
	Gas Pipe ★3	mm	φ41.3(Brazing Connection)	φ41.3(Brazing Connection)
	Oil Equalizing Pipe	mm	φ6.35	φ6.35
Machine Weight (Mass)		kg	365+420+420	420+420+420
Safety Devices			high pressure switch、fan drive overload protector、Over-current relay、Inverter overload protector	high pressure switch、fan drive overload protector、Over-current relay、Inverter overload protector
Defrost Method			Automatic intelligent defrosting	Automatic intelligent defrosting
Capacity Control		%	15～110	15～110
Refrigerant	Refrigerant Name		R-410A	R-410A
	Charge	kg	14+18.2+18.2	17+18.2+18.2
	Control		Electronic Expansion Valve	Electronic Expansion Valve
Refrigerator Oil			FVC68D	FVC68D
	Charge Volume	l	4+6+6	6+6+6
Standard Accessories			manual	manual

Model Name (Combination Unit)			CMV-V1350WSAM
Model Name (Independent Unit)			CMV-V450WSAM+CMV-V450WSAM +CMV-V450WSAM
★1 Cooling Capacity			135
★2 Heating Capacity			150
Casing Color			camel gray
Dimensions: (H×W×D)		mm	(1645×1340×765)×3
Heat Exchanger			Hydrophilic Aluminum
Comp.	Type		Scroll Compressor
	Piston Displacement	cm3/rev	(38+59+59)×3
	Number of Revolution	rpm	(30～78)×3
	Motor Input × Number of Units	kW	(3.88＋5.13＋5.13)×3
	Starting Method		Soft start-up
Fan	Type		Axial flow fan
	Motor Output	kW	0.400×6
	Air Flow Rate	m3/h	16000×3
	Drive		Variable frequency drive
Connecting Pipes	Liquid Pipe ★3	mm	φ22.2(Brazing Connection)
	Gas Pipe ★3	mm	φ41.3(Brazing Connection)
	Oil Equalizing Pipe	mm	φ6.35
Machine Weight (Mass)		kg	420+420+420
Safety Devices			high pressure switch、fan drive overload protector、 Over-current relay、Inverter overload protector
Defrost Method			Automatic intelligent defrosting
Capacity Control		%	15～110
Refrigerant	Refrigerant Name		R-410A
	Charge	kg	18.2+18.2+18.2
	Control		Electronic Expansion Valve
Refrigerator Oil			FVC68D
	Charge Volume	l	6+6+6
Standard Accessories			manual

1.2 Indoor Unit

1.2.1. Low ESP duct type

Model			CMV-22F1	CMV-28PF1	CMV-32F1
★1 Cooling Capacity		kW	2.2	2.8	3.2
★2 Heating Capacity		kW	2.5	3.2	3.5
Casing / Color			Galvanized steel	Galvanized steel	Galvanized steel
Dimensions: (W×D×H)		mm	863×485×234	863×485×234	913×485×234
Packing Dimensions: (W×D×H)		mm	910×515×245	910×515×245	950×515×245
Coil (Cross Fin Coil)	Rows × Stages × FPI		2×8×1.5mm	2×8×1.5mm	2×8×1.5mm
	Face Area	m2	0.11867	0.11867	0.139
Fan	Model		YSK110-16-4P	YSK110-16-4P	YSK110-20-4P
	Type		Centrifugal rotor	Centrifugal rotor	Centrifugal rotor
	Motor Output	W	60	60	60
	Air Flow Rate (H/L)	cfm	230	230	312
	External Static Pressure ★4	Pa	20	20	20
	Drive		3 fan speed	3 fan speed	3 fan speed
Temperature Control		℃	16-30	16-30	16-30
Air Filter			/	/	/
Piping Connections	Liquid Pipes	mm	φ6.35	φ6.35	φ6.35
	Gas Pipes	mm	φ9.52	φ9.52	φ12.7
	Drain Pipe	mm	DN20	DN20	DN20
Machine Weight (Mass)		kg	18.5	18.5	23
★5 Sound Level (H/L)		dB(A)	38	38	39
Refrigerant Control			EXV	EXV	EXV
EXV Model			SP-D029	SP-D029	SP-D029
Standard Accessories			Wired controller	Wired controller	Wired controller

Model			CMV-36F1	CMV-45F1	CMV-56F1
★1 Cooling Capacity		kW	3.6	4.5	5.6
★2 Heating Capacity		kW	4	5	6.3
Casing / Color			Galvanized steel	Galvanized steel	Galvanized steel
Dimensions: (W×D×H)		mm	913×485×234	1013×485×234	1133×485×234
Packing Dimensions: (W×D×H)		mm	950×515×245	1175×515×245	1175×515×245
Coil (Cross Fin Coil)	Rows × Stages × FPI		2×8×1.5mm	2×8×1.5mm	2×8×1.5mm
	Face Area	m2	0.139	0.159	0.18
Fan	Model		YSK110-20-4P	YSK110-40-4P	YSK110-50-4P
	Type		Centrifugal rotor	Centrifugal rotor	Centrifugal rotor
	Motor Output	W	80	100	100
	Air Flow Rate (H/L)	cfm	312	441	465
	External Static Pressure ★4	Pa	20	20	20
	Drive		3 fan speed	3 fan speed	3 fan speed
Temperature Control		℃	16-30	16-30	16-30
Air Filter			/	/	/
Piping Connections	Liquid Pipes	mm	φ6.35	φ6.35	φ6.35
	Gas Pipes	mm	φ12.7	φ12.7	φ12.7
	Drain Pipe	mm	DN20	DN20	DN20
Machine Weight (Mass)		kg	23	25	26
★5 Sound Level (H/L)		dB(A)	39	40	40
Refrigerant Control			EXV	EXV	EXV
EXV Model			SP-D029	SP-D030	SP-D030
Standard Accessories			Wired controller	Wired controller	Wired controller

Model			CMV-71F1	CMV-80F1	CMV-90F1
★1 Cooling Capacity		kW	7.1	8	9
★2 Heating Capacity		kW	7.8	8.8	10
Casing / Color			Galvanized steel	Galvanized steel	Galvanized steel
Dimensions: (W×D×H)		mm	1133×485×234	1133×485×234	1710× 510×245
Packing Dimensions: (W×D×H)		mm	1175×515×245	1175×515×245	1715×515×255
Coil (Cross Fin Coil)	Rows × Stages × FPI		2×8×1.5mm	2×8×1.5mm	3×8×1.8mm
	Face Area	m2	0.18	0.18	0.2747
Fan	Model		YSK110-85-4P（95）	YSK110-85-4P（95）	YSK110-85-4P(105)
	Type		Centrifugal rotor	Centrifugal rotor	Centrifugal rotor
	Motor Output	W	140	140	115×2
	Air Flow Rate (H/L)	cfm	530	530	882
	External Static Pressure ★4	Pa	20	20	20
	Drive		3 fan speed	3 fan speed	3 fan speed
Temperature Control		℃	16-30	16-30	16-30
Air Filter			/	/	/
Piping Connections	Liquid Pipes	mm	φ9.52	φ9.52	φ9.52
	Gas Pipes	mm	φ15.88	φ15.88	φ19.05
	Drain Pipe	mm	DN20	DN20	DN20
Machine Weight (Mass)		kg	26	26	37
★5 Sound Level (H/L)		dB(A)	41	41	43
Refrigerant Control			EXV	EXV	EXV
EXV Model			SP-D031	SP-D031	SP-D032
Standard Accessories			Wired controller	Wired controller	Wired controller

Model			CMV-100F1	CMV-112F1	CMV-125F1
★1 Cooling Capacity		kW	10	11.2	12.5
★2 Heating Capacity		kW	11.2	12.5	14
Casing / Color			Galvanized steel	Galvanized steel	Galvanized steel
Dimensions: (W×D×H)		mm	1710× 510×245	1710×510×245	1710×510×245
Packing Dimensions: (W×D×H)		mm	1715×515×255	1715×515×255	1715×515×255
Coil (Cross Fin Coil)	Rows × Stages × FPI		3×8×1.8mm	3×8×1.8mm	3×8×1.8mm
	Face Area	m2	0.2747	0.2747	0.2747
Fan	Model		YSK110-85-4P(105)	YSK110-85-4P(105)	YSK110-85-4P(105)
	Type		Centrifugal rotor	Centrifugal rotor	Centrifugal rotor
	Motor Output	W	115×2	115×2	115×2
	Air Flow Rate (H/L)	cfm	882	1353	1353
	External Static Pressure ★4	Pa	20	20	20
	Drive		3 fan speed	3 fan speed	3 fan speed
Temperature Control		℃	16-30	16-30	16-30
Air Filter			/	/	/
Piping Connections	Liquid Pipes	mm	φ9.52	φ9.52	φ9.52
	Gas Pipes	mm	φ19.05	φ19.05	φ19.05
	Drain Pipe	mm	DN20	DN20	DN20
Machine Weight (Mass)		kg	37	37	37
★5 Sound Level (H/L)		dB(A)	43	43	43
Refrigerant Control			EXV	EXV	EXV
EXV Model			SP-D032	SP-D032	SP-D032
Standard Accessories			Wired controller	Wired controller	Wired controller

1.2.2. Ceiling Cassette

Model			CMV-22Q	CMV-28Q	CMV-36Q
★1 Cooling Capacity		kW	2.2	2.8	3.6
★2 Heating Capacity		kW	2.5	3.2	4
Casing / Color			Galvanized steel	Galvanized steel	Galvanized steel
Dimensions: (W×D×H)		mm	580×580×275	580×580×275	580×580×275
Packing Dimensions: (W×D×H)		mm	745×675×375	745×675×375	745×675×375
Coil (Cross Fin Coil)	Rows × Stages × FPI		2×10×1.55mm	2×10×1.55mm	2×10×1.55mm
	Face Area	m2	0.234	0.234	0.234
Fan	Model		YDK-18T-6	YDK-18T-6	YDK-35T-4
	Type		Centrifugal rotor	Centrifugal rotor	Centrifugal rotor
	Motor Output	W	65×1	65×1	70×1
	Air Flow Rate (H/L)	cfm	294	294	353
	External Static Pressure ★4	Pa	0	0	0
	Drive		3 fan speed	3 fan speed	3 fan speed
Temperature Control		℃	16-30	16-30	16-30
Piping Connections	Liquid Pipes	mm	φ6.35	φ6.35	φ6.35
	Gas Pipes	mm	φ9.52	φ9.52	φ9.52
	Drain Pipe	mm	DN25	DN25	DN25
Machine Weight (Mass)		kg	22	22	25
★5 Sound Level (H/L)		dB(A)	38	38	38
Refrigerant Control			EXV	EXV	EXV
Decoration Panels	Model		ZSP-S009	ZSP-S009	ZSP-S009
	Color		Camel Grey	Camel Grey	Camel Grey
	Dimensions: (H×W×D)	mm	650×650×30	650×650×30	650×650×30
	Packing Dimensions: (H×W×D)	mm	750×750×95	750×750×95	750×750×95
	Air Filter		built-in	built-in	built-in
	Weight	Kg	4	4	4
EXV Model			SP-D029	SP-D029	SP-D029
Standard Accessories			remote controller	remote controller	remote controller

Model			CMV-45Q	CMV-56Q	CMV-71Q
★1 Cooling Capacity		kW	4.5	5.6	7.1
★2 Heating Capacity		kW	5	6.3	8
Casing / Color			Galvanized steel	Galvanized steel	Galvanized steel
Dimensions: (W×D×H)		mm	580×580×275	580×580×275	840×840×230
Packing Dimensions: (W×D×H)		mm	745×675×375	745×675×375	920×920×310
Coil (Cross Fin Coil)	Rows × Stages × FPI		2×10×1.55mm	2×10×1.55mm	2×8×1.45mm
	Face Area	m2	0.234	0.234	0.302
Fan	Model		YDK-35T-4 1	YDK-35T-4 1	YDK-55T-6
	Type		Centrifugal rotor	Centrifugal rotor	Centrifugal rotor
	Motor Output	W	75×1	75×1	154×1
	Air Flow Rate (H/L)	cfm	441	441	676
	External Static Pressure ★4	Pa	0	0	0
	Drive		3 fan speed	3 fan speed	3 fan speed
Temperature Control		℃	16-30	16-30	16-30
Piping Connections	Liquid Pipes	mm	φ6.35	φ6.35	φ9.52
	Gas Pipes	mm	φ12.7	φ12.7	φ15.88
	Drain Pipe	mm	DN25	DN25	DN25
Machine Weight (Mass)		kg	25	25	28.5
★5 Sound Level (H/L)		dB(A)	39	39	39
Refrigerant Control			EXV	EXV	EXV
Decoration Panels	Model		ZSP-S009	ZSP-S009	CSP-S014
	Color		Camel Grey	Camel Grey	Camel Grey
	Dimensions: (H×W×D)	mm	650×650×30	650×650×30	950×950×50
	Packing Dimensions: (H×W×D)	mm	750×750×95	750×750×95	1030×1030×105
	Air Filter		built-in	built-in	built-in
	Weight	Kg	4	4	5
EXV Model			SP-D030	SP-D030	SP-D031
Standard Accessories			remote controller	remote controller	remote controller

Model			CMV-80Q	CMV-90Q	CMV-100Q
★1 Cooling Capacity		kW	8	9	10
★2 Heating Capacity		kW	8.8	10	11
Casing / Color			Galvanized steel	Galvanized steel	Galvanized steel
Dimensions: (W×D×H)		mm	840×840×230	840×840×285	840×840×285
Packing Dimensions: (W×D×H)		mm	920×920×310	920×920×375	920×920×375
Coil (Cross Fin Coil)	Rows × Stages × FPI		2×8×1.45mm	2×12×1.45mm	2×12×1.45mm
	Face Area	m2	0.302	0.467	0.467
Fan	Model		YDK-55T-6	YDK-75T-6	YDK-75T-6
	Type		Centrifugal rotor	Centrifugal rotor	Centrifugal rotor
	Motor Output	W	154×1	170×1	170×1
	Air Flow Rate (H/L)	cfm	676	1000	1000
	External Static Pressure ★4	Pa	0	0	0
	Drive		3 fan speed	3 fan speed	3 fan speed
Temperature Control		℃	16-30	16-30	16-30
Piping Connections	Liquid Pipes	mm	φ9.52	φ9.52	φ9.52
	Gas Pipes	mm	φ15.88	φ19.05	φ19.05
	Drain Pipe	mm	DN25	DN25	DN25
Machine Weight (Mass)		kg	28.5	32	32
★5 Sound Level (H/L)		dB(A)	39	41	41
Refrigerant Control			EXV	EXV	EXV
Decoration Panels	Model		CSP-S014	CSP-S014	CSP-S014
	Color		Camel Grey	Camel Grey	Camel Grey
	Dimensions: (H×W×D)	mm	950×950×50	950×950×50	950×950×50
	Packing Dimensions: (H×W×D)	mm	1030×1030×105	1030×1030×105	1030×1030×105
	Air Filter		built-in	built-in	built-in
	Weight	Kg	5	5	5
EXV Model			SP-D031	SP-D032	SP-D032
Standard Accessories			remote controller	remote controller	remote controller

Model			CMV-112Q	CMV-125	CMV-140Q
★1 Cooling Capacity		kW	11.2	12.5	14
★2 Heating Capacity		kW	12.5	14	15
Casing / Color			Galvanized steel	Galvanized steel	Galvanized steel
Dimensions: (W×D×H)		mm	840×840×285	840×840×285	840×840×285
Packing Dimensions: (W×D×H)		mm	920×920×375	920×920×375	920×920×375
Coil (Cross Fin Coil)	Rows × Stages × FPI		2×12×1.45mm	2×12×1.45mm	2×12×1.45mm
	Face Area	m2	0.467	0.467	0.467
Fan	Model		YDK-75T-6	YDK-75T-6	YDK-75T-6
	Type		Centrifugal rotor	Centrifugal rotor	Centrifugal rotor
	Motor Output	W	170×1	170×1	170×1
	Air Flow Rate (H/L)	cfm	1000	1000	1000
	External Static Pressure ★4	Pa	0	0	0
	Drive		3 fan speed	3 fan speed	3 fan speed
Temperature Control		℃	16-30	16-30	16-30
Piping Connections	Liquid Pipes	mm	φ9.52	φ9.52	φ9.52
	Gas Pipes	mm	φ19.05	φ19.05	φ19.05
	Drain Pipe	mm	DN25	DN25	DN25
Machine Weight (Mass)		kg	32	32	32
★5 Sound Level (H/L)		dB(A)	41	41	41
Refrigerant Control			EXV	EXV	EXV
Decoration Panels	Model		CSP-S014	CSP-S014	CSP-S014
	Color		Camel Grey	Camel Grey	Camel Grey
	Dimensions: (H×W×D)	mm	950×950×50	950×950×50	950×950×50
	Packing Dimensions: (H×W×D)	mm	1030×1030×105	1030×1030×105	1030×1030×105
	Air Filter		built-in	built-in	built-in
	Weight	Kg	5	5	5
EXV Model			SP-D032	SP-D032	SP-D032
Standard Accessories			remote controller	remote controller	remote controller

1.2.3. Floor Ceiling

Model			CMV-45LD	CMV-56LD	CMV-71LD
★1 Cooling Capacity		kW	4.5	5.6	7.1
★2 Heating Capacity		kW	5	6.3	8
Casing / Color			Galvanized steel	Galvanized steel	Galvanized steel
Dimensions: (W×D×H)		mm	880×208×635	880×208×635	1270×230×635
Packing Dimensions: (W×D×H)		mm	970×301×711	970×301×711	1340×301×721
Coil (Cross Fin Coil)	Rows × Stages × FPI		3×10×1.8mm	3×10×1.8mm	2×10×1.6mm
	Face Area	m2	0.1525	0.1525	0.24875
Fan	Model		YSK110-65LD-4P 3H85	YSK110-65LD-4P 3H85	YSK110-45LD-4P 3H90 YSK110-22LD-4P 3H90L
	Type		Centrifugal rotor	Centrifugal rotor	Centrifugal rotor
	Motor Output	W	65×1	65×1	100×1+60×1
	Air Flow Rate (H/L)	cfm	465	465	647
	External Static Pressure ★4	Pa	0	0	0
	Drive		3 fan speed	3 fan speed	3 fan speed
Temperature Control		℃	16-30	16-30	16-30
Piping Connections	Liquid Pipes	mm	φ6.35	φ6.35	φ9.52
	Gas Pipes	mm	φ12.7	φ12.7	φ15.88
	Drain Pipe	mm	DN20	DN20	DN20
Machine Weight (Mass)		kg	30	30	41
★5 Sound Level (H/L)		dB(A)	39	40	41
Refrigerant Control			EXV	EXV	EXV
EXV Model			SP-D030	SP-D030	SP-D031
Standard Accessories			Wired controller	Wired controller	Wired controller

Model			CMV-80LD	CMV-112LD
★1 Cooling Capacity		kW	8	11.2
★2 Heating Capacity		kW	8.8	12.5
Casing / Color			Galvanized steel	Galvanized steel
Dimensions: (W×D×H)		mm	1270×230×635	1660×230×635
Packing Dimensions: (W×D×H)		mm	1340×301×721	1730×301×721
Coil (Cross Fin Coil)	Rows × Stages × FPI		2×10×1.6mm	2×10×1.6mm
	Face Area	m2	0.24875	0.34625
Fan	Model		YSK110-45LD-4P3H90 YSK110-22LD-4P3H90L	YSK110-85LD-4P3H90
	Type		Centrifugal rotor	Centrifugal rotor
	Motor Output	W	100×1+60×1	125×2
	Air Flow Rate (H/L)	cfm	647	1059
	External Static Pressure ★4	Pa	0	0
	Drive		3 fan speed	3 fan speed
Temperature Control		℃	16-30	16-30
Piping Connections	Liquid Pipes	mm	φ9.52	φ9.52
	Gas Pipes	mm	φ15.88	φ19.05
	Drain Pipe	mm	DN20	DN20
Machine Weight (Mass)		kg	41	48
★5 Sound Level (H/L)		dB(A)	41	43
Refrigerant Control			EXV	EXV
EXV Model			SP-D031	SP-D032
Standard Accessories			Wired controller	Wired controller

1.2.4 Wall-mounted

Model			CMV-22G (M84)	CMV-28G (M84)	CMV-36G (M84)
★1 Cooling Capacity		kW	2.2	2.8	3.6
★2 Heating Capacity		kW	2.5	3.2	4
Casing / Color			plastic	plastic	plastic
Dimensions: (W×D×H)		mm	800×280×185	800×280×185	800×280×185
Packing Dimensions: (W×D×H)		mm	880×360×250	880×360×250	880×360×250
Coil (Cross Fin Coil)	Rows × Stages × FPI		2×14×1.4mm	2×14×1.4mm	2×14×1.4mm
	Face Area	m2	0.18081	0.18081	0.18081
Fan	Model		YDK-16-4	YDK-16-4	YDK-16-4
	Type		Cross flow fan	Cross flow fan	Cross flow fan
	Motor Output	W	40×1	40×1	40×1
	Air Flow Rate (H/L)	cfm	329	329	329
	External Static Pressure ★4	Pa	0	0	0
	Drive		PJ speed	PJ speed	PJ speed
Temperature Control		℃	16-30	16-30	16-30
Piping Connections	Liquid Pipes	mm	φ6.35	φ6.35	φ6.35
	Gas Pipes	mm	φ9.52	φ9.52	φ12.7
	Drain Pipe	mm	DN20	DN20	DN20
Machine Weight (Mass)		kg	10	10	10
★5 Sound Level (H/L)		dB(A)	33	33	33
Refrigerant Control			EXV	EXV	EXV
EXV Model			SP-D029	SP-D029	SP-D029
Standard Accessories			remote controller	remote controller	remote controller

Model			CMV-45G (P84)	CMV-51G (P84)	CMV-70G (W84)
★1 Cooling Capacity		kW	4.5	5.1	7
★2 Heating Capacity		kW	5	5.6	7.7
Casing / Color			plastic	plastic	plastic
Dimensions: (W×D×H)		mm	900×282×205	900×282×205	1080×304×221
Packing Dimensions: (W×D×H)		mm	1085×380×300	1085×380×300	1085×380×300
Coil (Cross Fin Coil)	Rows × Stages × FPI		2×16×1.6mm	2×16×1.6mm	2×16×1.6mm
	Face Area	m2	0.23688	0.23688	0.294
Fan	Model		YDK-18-4	YDK-18-4	YDK-26-4
	Type		Cross flow fan	Cross flow fan	Cross flow fan
	Motor Output	W	60×1	60×1	60×1
	Air Flow Rate (H/L)	cfm	500	500	618
	External Static Pressure ★4	Pa	0	0	0
	Drive		PJ speed	PJ speed	PJ speed
Temperature Control		℃	16-30	16-30	16-30
Piping Connections	Liquid Pipes	mm	φ6.35	φ6.35	φ9.52
	Gas Pipes	mm	φ12.7	φ12.7	φ15.88
	Drain Pipe	mm	DN20	DN20	DN20
Machine Weight (Mass)		kg	14	14	16
★5 Sound Level (H/L)		dB(A)	40	40	44
Refrigerant Control			EXV	EXV	EXV
EXV Model			SP-D030	SP-D030	SP-D031
Standard Accessories			remote controller	remote controller	remote controller

1.2.5 Middle ESP Duct

Model			CMV-71F2	CMV-80F2	CMV-90F2
★1 Cooling Capacity		kW	7.1	8	9
★2 Heating Capacity		kW	7.7	8.8	10
Casing / Color			Galvanized steel	Galvanized steel	Galvanized steel
Dimensions: (W×D×H)		mm	1045×580×385	1045×580×385	1170×600×430
Packing Dimensions: (W×D×H)		mm	1180×610×485	1180×610×485	1315×630×545
Coil (Cross Fin Coil)	Rows × Stages × FPI		2×13×1.5mm	2×13×1.5mm	3×15×2.0mm
	Face Area	m2	0.26	0.26	0.350625
Fan	Model		YSK139-150-4P	YSK139-150-4P	YSK139-180-4P
	Type		Centrifugal rotor	Centrifugal rotor	Centrifugal rotor
	Motor Output	W	300×1	300×1	450×1
	Air Flow Rate (H/L)	cfm	706	706	1330
	External Static Pressure ★4	Pa	70	70	70
	Drive		3 fan speed	3 fan speed	3 fan speed
Temperature Control		℃	16-30	16-30	16-30
Piping Connections	Liquid Pipes	mm	φ9.52	φ9.52	φ9.52
	Gas Pipes	mm	φ15.88	φ15.88	φ19.05
	Drain Pipe	mm	DN20	DN20	DN20
Machine Weight (Mass)		kg	45	45	70
★5 Sound Level (H/L)		dB(A)	42	42	44
Refrigerant Control			EXV	EXV	EXV
EXV Model			SP-D031	SP-D031	SP-D032
Standard Accessories			Wired controller	Wired controller	Wired controller

Model			CMV-100F2	CMV-120F2	CMV-150F2
★1 Cooling Capacity		kW	10	12	15
★2 Heating Capacity		kW	11	13	17
Casing / Color			Galvanized steel	Galvanized steel	Galvanized steel
Dimensions: (W×D×H)		mm	1170×600×430	1170×600×430	1320×600×430
Packing Dimensions: (W×D×H)		mm	1315×630×545	1315×630×545	1465×630×545
Coil (Cross Fin Coil)	Rows × Stages × FPI		3×15×2.0mm	3×15×2.0mm	3×15×2.0mm
	Face Area	m2	0.350625	0.350625	0.406875
Fan	Model		YSK139-180-4P	YSK139-180-4P	YSK139-350-4P
	Type		Centrifugal rotor	Centrifugal rotor	Centrifugal rotor
	Motor Output	W	450×1	450×1	800×1
	Air Flow Rate (H/L)	cfm	1330	1353	1765
	External Static Pressure ★4	Pa	70	70	70
	Drive		3 fan speed	3 fan speed	3 fan speed
Temperature Control		℃	16-30	16-30	16-30
Piping Connections	Liquid Pipes	mm	φ9.52	φ9.52	φ9.52
	Gas Pipes	mm	φ19.05	φ19.05	φ19.05
	Drain Pipe	mm	DN20	DN20	DN20
Machine Weight (Mass)		kg	70	70	75
★5 Sound Level (H/L)		dB(A)	44	44	44
Refrigerant Control			EXV	EXV	EXV
EXV Model			SP-D032	SP-D032	SP-D040
Standard Accessories			Wired controller	Wired controller	Wired controller

1.2.6 High ESP Duct

Model			CMV-71F3	CMV-80F3	CMV-90F3
★1 Cooling Capacity		kW	7.1	8	9
★2 Heating Capacity		kW	7.7	8.8	10
Casing / Color			Galvanized steel	Galvanized steel	Galvanized steel
Dimensions: (W×D×H)		mm	1045×580×385	1045×580×385	1170×600×430
Packing Dimensions: (W×D×H)		mm	1180×610×485	1180×610×485	1315×630×545
Coil (Cross Fin Coil)	Rows × Stages × FPI		2×13×1.5mm	2×13×1.5mm	3×15×2.0mm
	Face Area	m2	0.26	0.26	0.350625
Fan	Model		YSK139-150-4P	YSK139-150-4P	YSK139-180-4P
	Type		Centrifugal rotor	Centrifugal rotor	Centrifugal rotor
	Motor Output	W	300×1	300×1	500×1
	Air Flow Rate (H/L)	cfm	706	706	1330
	External Static Pressure ★4	Pa	120	120	120
	Drive		3 fan speed	3 fan speed	3 fan speed
Temperature Control		℃	16-30	16-30	16-30
Piping Connections	Liquid Pipes	mm	φ9.52	φ9.52	φ9.52
	Gas Pipes	mm	φ15.88	φ15.88	φ19.05
	Drain Pipe	mm	DN20	DN20	DN20
Machine Weight (Mass)		kg	45	45	70
★5 Sound Level (H/L)		dB(A)	42	42	44
Refrigerant Control			EXV	EXV	EXV
EXV Model			SP-D031	SP-D031	SP-D032
Standard Accessories			Wired controller	Wired controller	Wired controller

Model			CMV-100F3	CMV-120F3	CMV-150F3
★1 Cooling Capacity		kW	10	12	15
★2 Heating Capacity		kW	11	13	17
Casing / Color			Galvanized steel	Galvanized steel	Galvanized steel
Dimensions: (W×D×H)		mm	1170×600×430	1170×600×430	1320×600×430
Packing Dimensions: (W×D×H)		mm	1315×630×545	1315×630×545	1465×630×545
Coil (Cross Fin Coil)	Rows × Stages × FPI		3×15×2.0mm	3×15×2.0mm	3×15×2.0mm
	Face Area	m2	0.350625	0.350625	0.406875
Fan	Model		YSK139-180-4P	YSK139-180-4P	YSK139-350-4P
	Type		Centrifugal rotor	Centrifugal rotor	Centrifugal rotor
	Motor Output	W	500×1	500×1	900×1
	Air Flow Rate (H/L)	cfm	1341	1353	1765
	External Static Pressure ★4	Pa	120	120	120
	Drive		3 fan speed	3 fan speed	3 fan speed
Temperature Control		℃	16-30	16-30	16-30
Piping Connections	Liquid Pipes	mm	φ9.52	φ9.52	φ9.52
	Gas Pipes	mm	φ19.05	φ19.05	φ19.05
	Drain Pipe	mm	DN20	DN20	DN20
Machine Weight (Mass)		kg	70	70	75
★5 Sound Level (H/L)		dB(A)	44	44	44
Refrigerant Control			EXV	EXV	EXV
EXV Model			SP-D032	SP-D032	SP-D040
Standard Accessories			Wired controller	Wired controller	Wired controller

Part 3
Refrigerant Circuit

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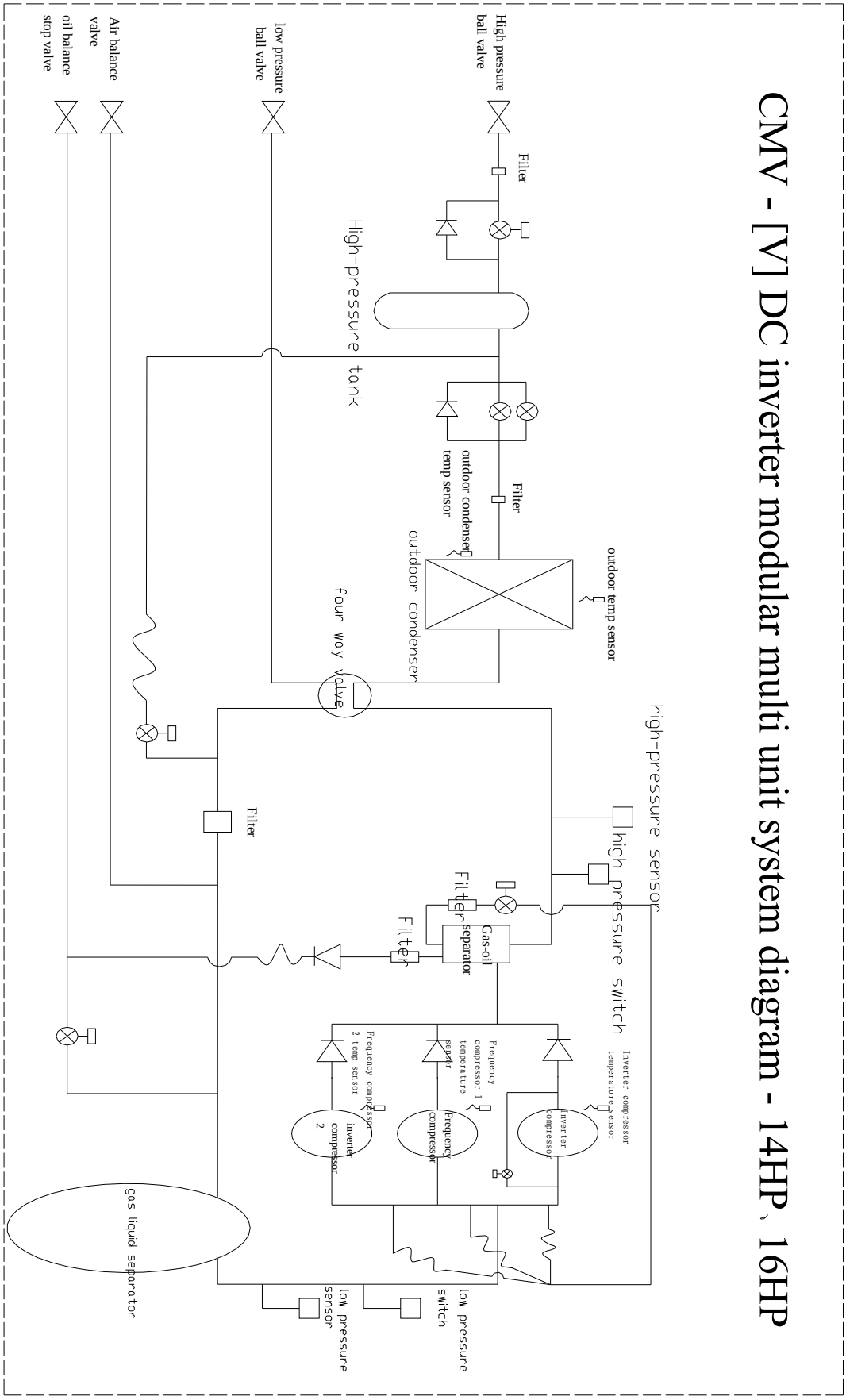
1. System Principles

1.1. System principle diagram(8HP、10HP、12HP system)

Name	Main functions
Variable-frequency compressor	Variable-frequency compressor runs through a variety of frequency converter input speed, a fixed-frequency compressor only work under the constant rotary-speed.
Fixed-frequency compressor 1	
Oil-air separator	Oil and gas separation, to ensure compressor oil-return sufficient and normal.
High-pressure liquid-tank	Store excess refrigerant in the system, adjust the amount of refrigeration cycle
Gas-liquid separator	For gas-liquid separation, to ensure that the compressor normally work, to prevent the compressor liquid impact
Four-way valve	When system is refrigerating and heating, for controlling the refrigerant flow direction.
One-way valve	To provide one-way refrigerant flow path, while preventing reverse flow of refrigerant
High-pressure switch	To prevent the compressor discharge pressure is too high, damage to compressor, movement pressure 4.2MPa, 3.0MPa pressure recovery
Low-pressure switch	Low pressure protection of the compressor, action pressure is 0.08MPa, 0.15MPa pressure recovery
High pressure sensor	Used to real-time detect system work pressure, adjust fan speed, control outdoor unit fluid-side path bypass switch
Low pressure sensor	Used to real-time detect system work pressure, adjust fan speed, control outdoor unit fluid-side path bypass switch
Outdoor electronic expansion valve	Outdoor unit has two identical parallel electronic expansion valve, in the system of cooling and heating, adjust refrigerant cycling quantity
Magnetic valve module	Magnetic valve module is used to stop module refrigerant.
Liquid by-pass magnetic valve	Liquid by-pass magnetic valve is used to prevent compressor exhaust temperature is too high.
Variable-frequency compressor unloading valve	Used to protect variable-frequency compressor
Return-oil magnetic valve	Return-oil magnetic valve is used to control the return-oil path of module.
Average-oil magnetic valve	Average-oil magnetic valve is used to balance compressor lubricants of every working module in the system.
Variable-frequency compressor exhaust temperature sensor	Compressor exhaust temperature sensor is used for real-time detection on the compressor exhaust temperature, to protect the compressor
Fixed-frequency Compressor 1 exhaust temperature sensor	
Circumstance temperature sensor	For real-time to detect circumstance temperature, provide evidence for system control.
Condenser temperature sensor	For real-time to detect system condenser temperature, and provide relative protection

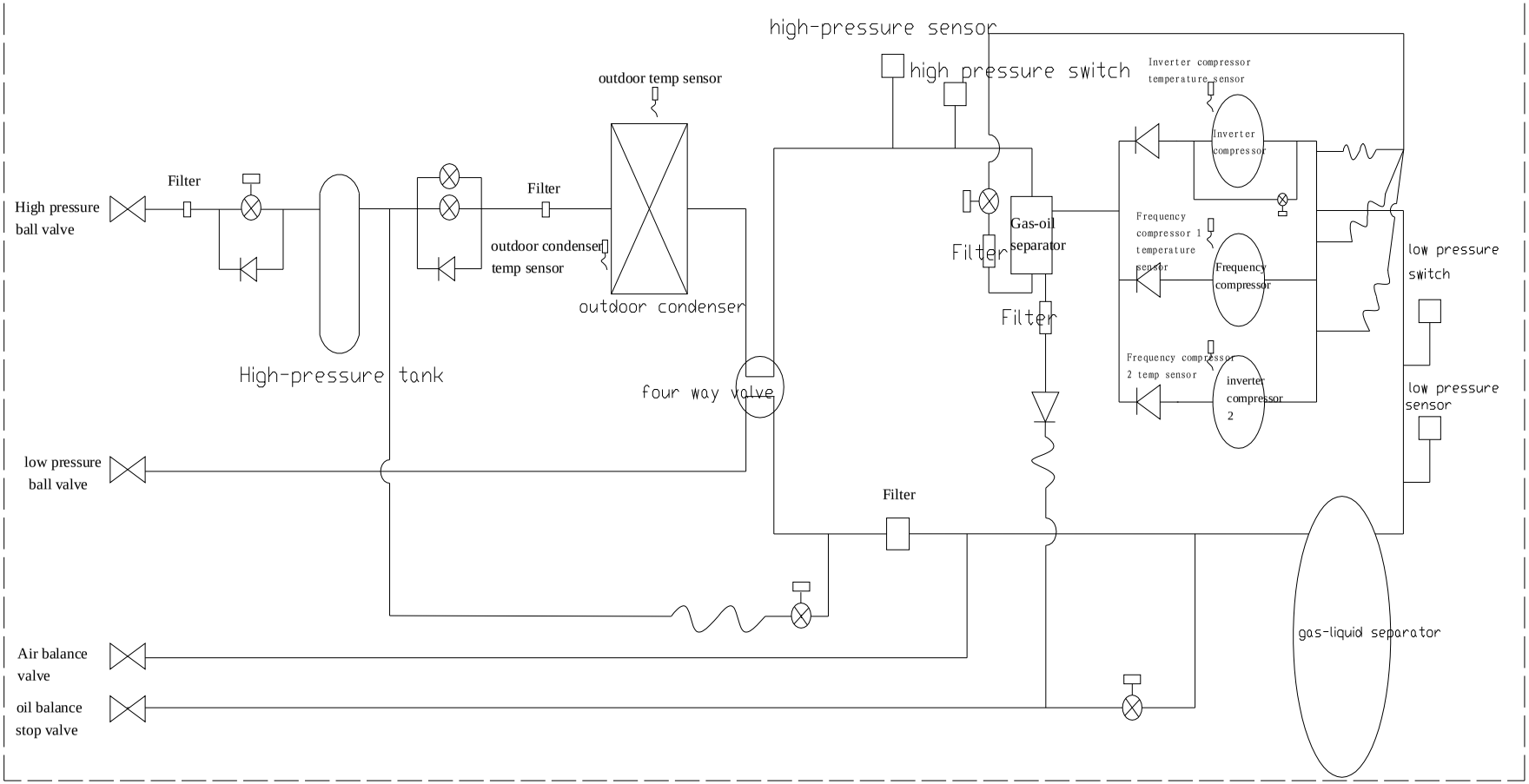
CMV - [V] DC inverter modular multi unit system diagram - 14HP、16HP



14 HP 、16 Hp system

Name	Function
Inverter compressor	Through inverter, variable frequency compressor input various of frequency to adjust the speed, fixed frequency compressor only fixed operated under fixed-power.
Invariable frequency compressor 1	
Invariable frequency compressor 2	
Oil-gas separator	For oil and gas separation, ensure the compressor return oil normal.
High pressure tank	For storaging excess of refrigerant, adjust the refrigerant circulation
Gas-liquid separator	Gas-liquid separation, guarantee for the normal work, prevent compressor liquid hammer
Four way valve	While heating or cooling, for shifting refrigerant flow
Check valve	Providing the single flow path for refrigerant, and stop the reverse flow.
High pressure switch	To prevent the damage caused by compressor exhaust overhigh pressure, operating pressure is 4.2 Mpa, recovered pressure is 3.0 MPa
Low pressure switch	Protect the compressor from low pressure, operating pressure is 0.08 MPa, recovered pressure is 0.15 MPa
High-pressure sensor	Used for checking system working pressure, adjust the fan speed,the same time control the switch for outdoor liquid bypass and liquid flow switch etc
Low pressure sensor	Used for checking system working pressure, adjust the fan speed,the same time control the switch for outdoor liquid bypass and liquid flow switch etc
Outdoor electronic expansion valve	The two electronic expansion valves for exactly the same in the system, used for adjusting the system refrigerant circulation while cooling and heating.
Modular magnetic valves	Module used by electromagnetic valve module, make each refrigerant air-conditioners can operate independently
Liquid side magnetic valves	Liquid side electromagnetic valve is used to prevent compressor exhaust temperature of overhigh
Inverter compressor unloading magnetic valves	Used for protecting the inverter compressors,
Oil return magnetic valve	Return oil electromagnetic valve is used to control the modular return oil road.
Oil balance magnetic valve	Electromagnetic valve is used to balance oil system of compressor lubricants operation module
Exhaust temperature sensor of frequency compressor	Compressor exhaust temperature sensor for the check the exhaust temperature of compressor, and protect compressors.
Exhaust temperature sensor for fixed-frequency compressor 1and 2	
Amibent temp sensor	Real-time detection of environmental temperature, provides the basis for controlling system.
Condenser temp sensor	Real-time detection of system condenser temperature, provide corresponding protection.

CMV - [V] DC inverter modular multi unit system diagram - 14HP、16HP



1.2 Functional components layout

8HP、10HP system

Front view

High-pressure sensor

High pressure switch

Return oil capillary

Oil gas separator

Inverter compressor

Oil balancing stop valve

Inverter compressor unloading solenoid valves

Return oil solenoid valves

outdoor electronic expansion

Four way valve

Oil balance solenoid

Invariable frequency compressor

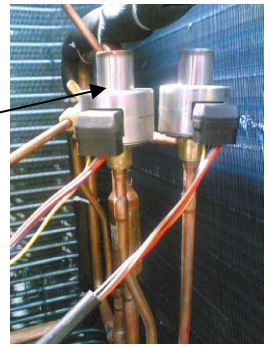
Modular solenoid valves

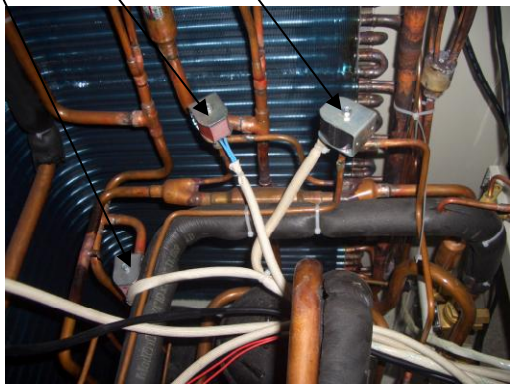
Liquid side solenoid valves

High-pressure ball

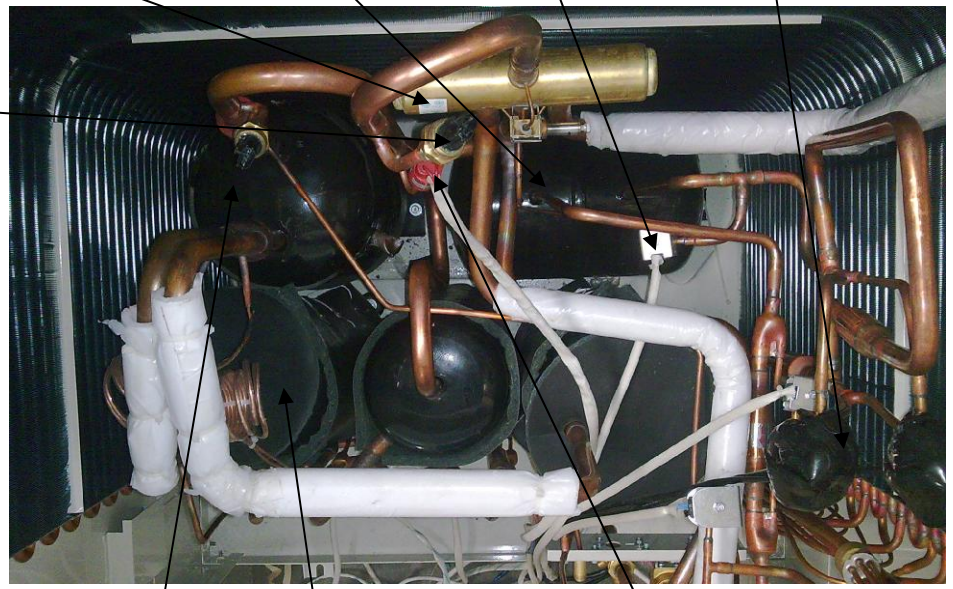
Low-pressure ball

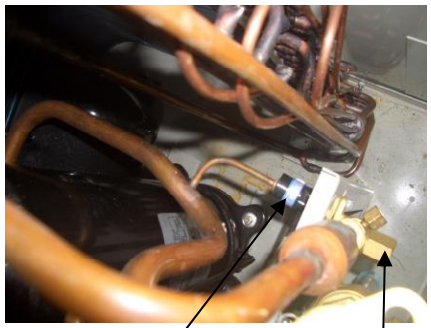
Air balance valve





Top view





High-pressure tank

Liquid side solenoid valves

Modular solenoid valves

Low pressure sensor

High pressure sensor

Four way valve

High pressure sensor

Low pressure switch

High pressure ball valve

Gas-liquid separator

Inverter compressor

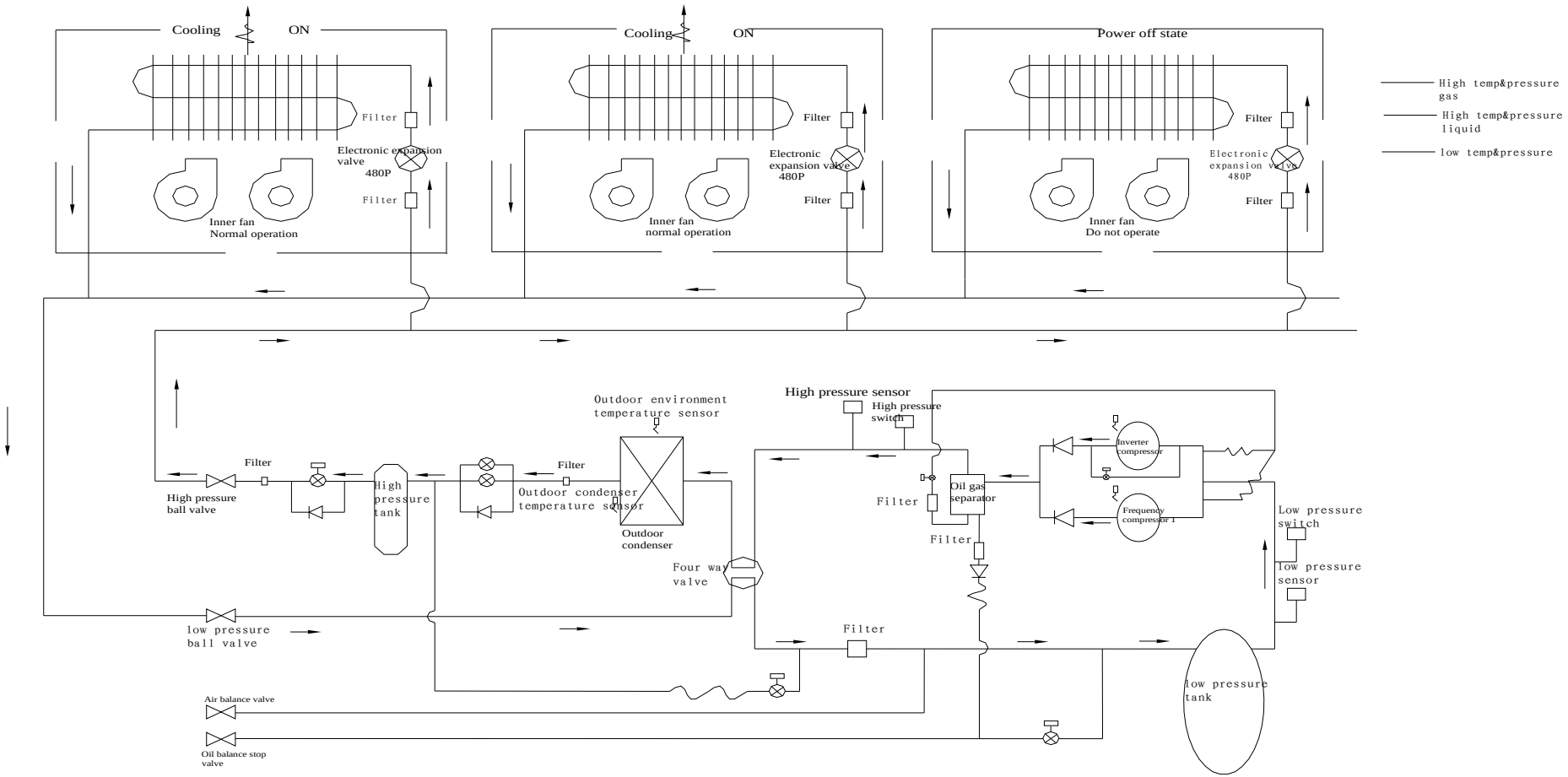
High pressure switch

12HP、14HP、16Hp system （12 HP system with two compressors）

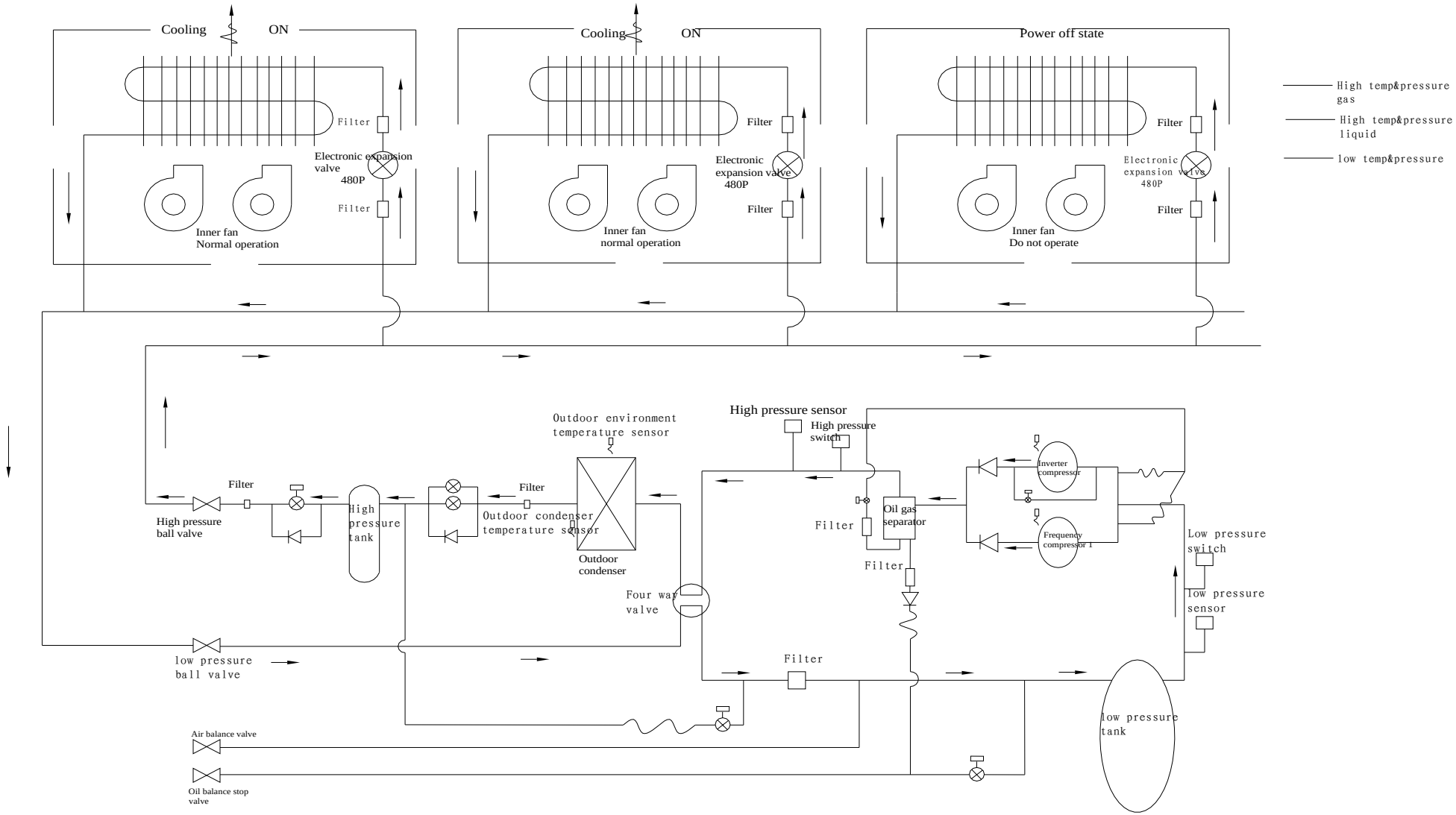
1. 3. Refrigerant flow chart of operation mode

Take 8HP、10HP、12HP for example, refrigerant flow under each working condition as show in diagram. Compare 14HP、16HP system with 14HP、16HP, more than a compressor, but the refrigerant flow is same with 8HP、10HP、12HP, Therefore no longer detail.

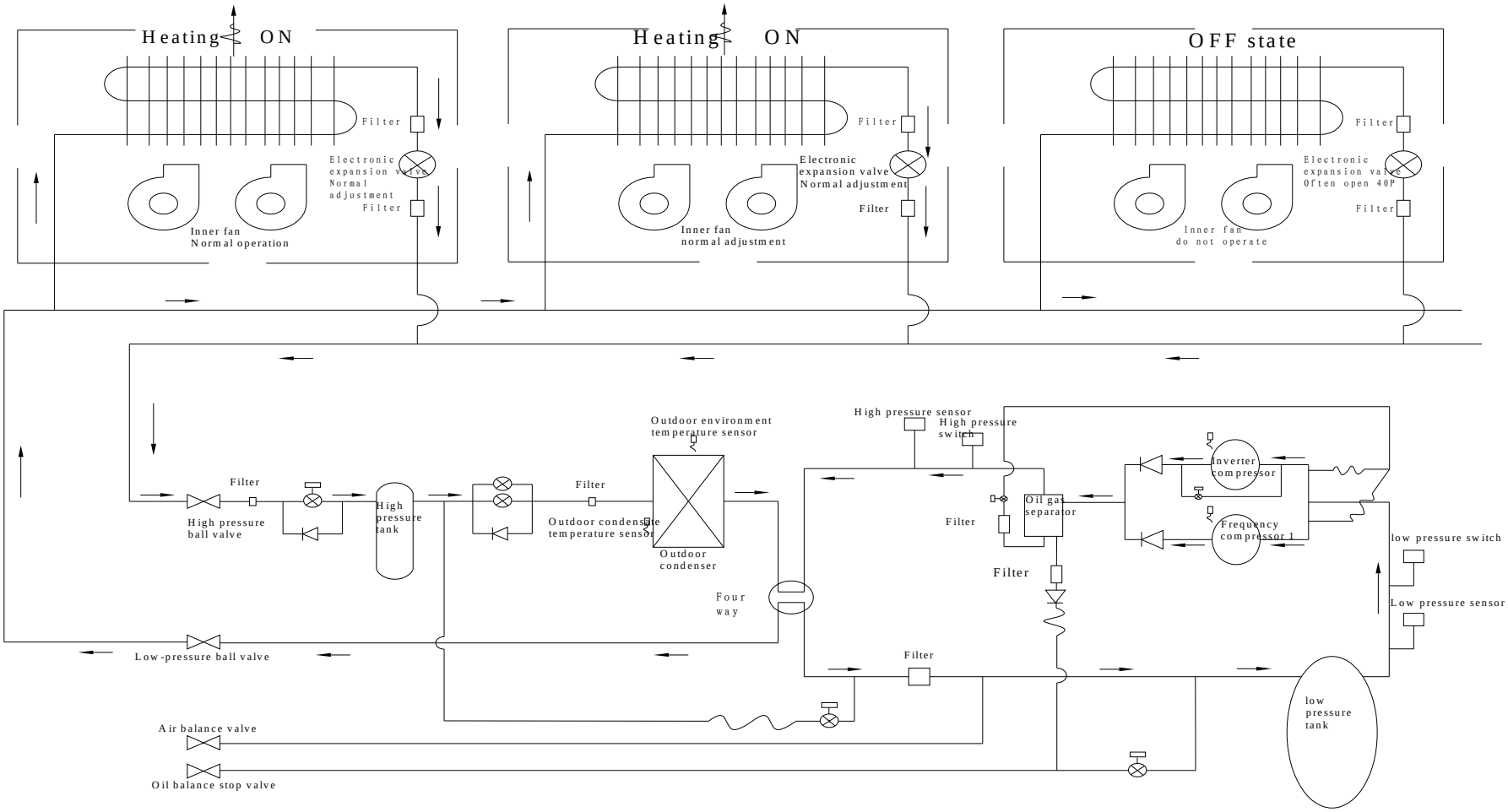
Cooling operation（8HP、10HP、12HP）



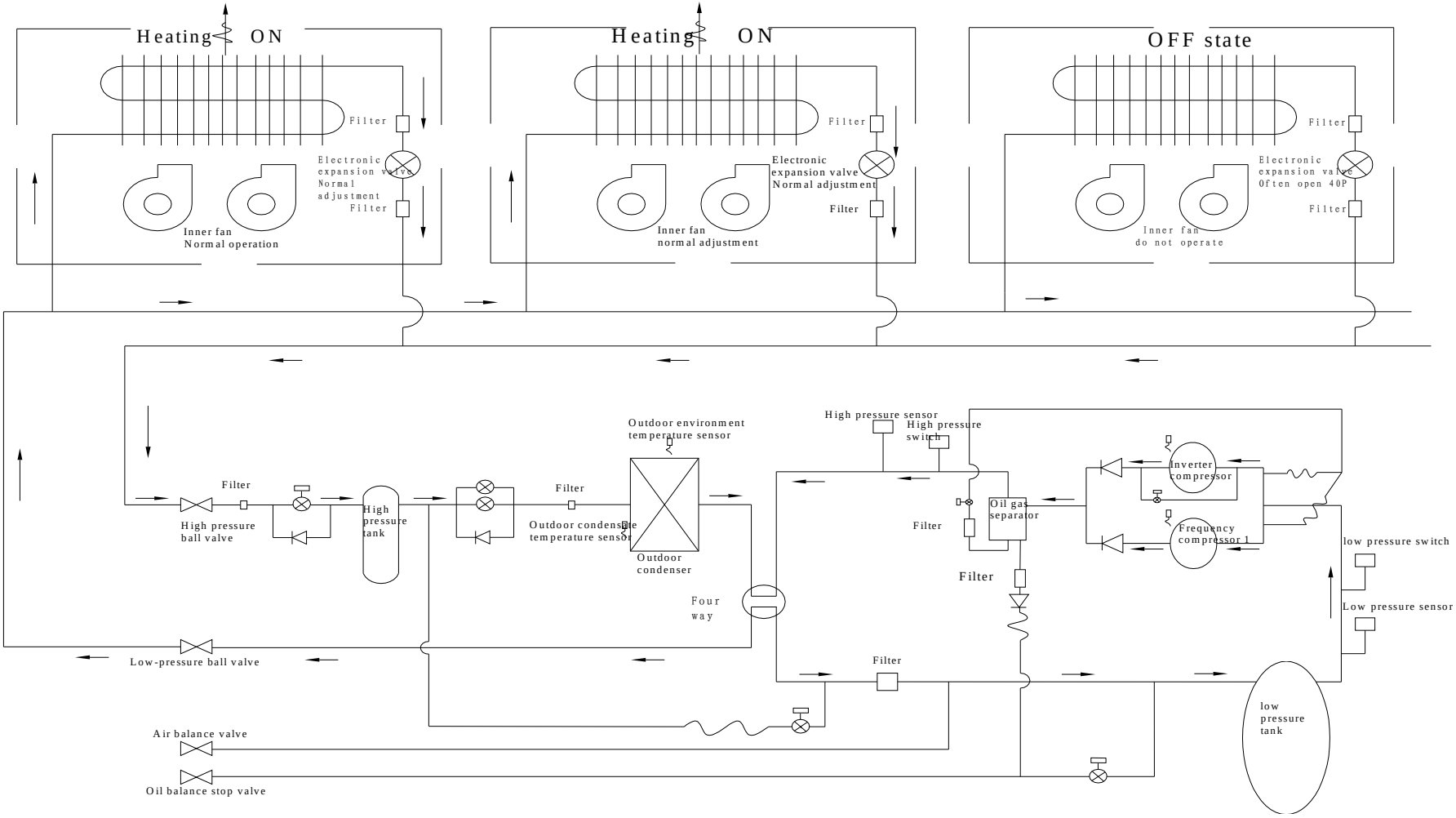
Cooling oil return operation



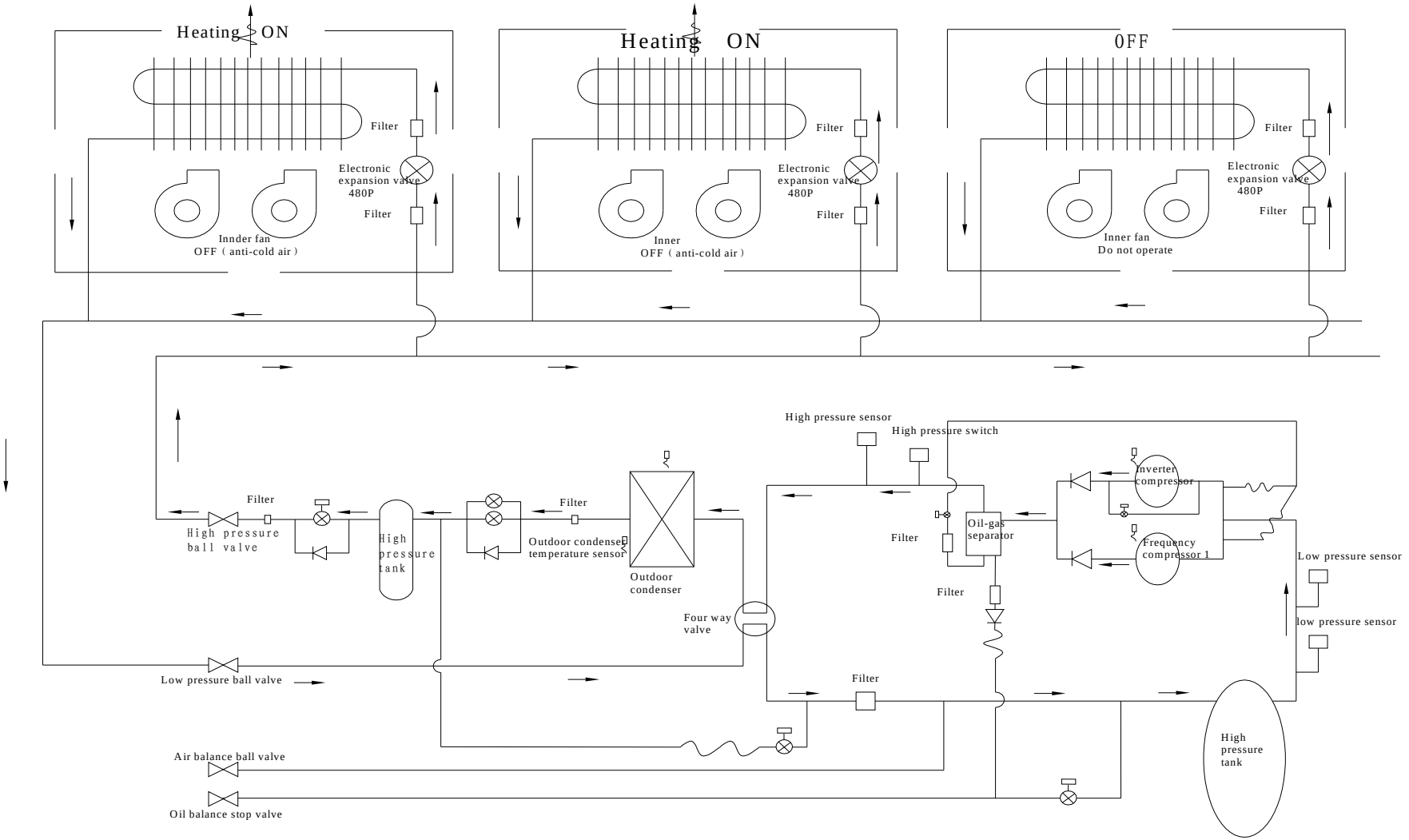
Heating operation



Heating oil returned operation



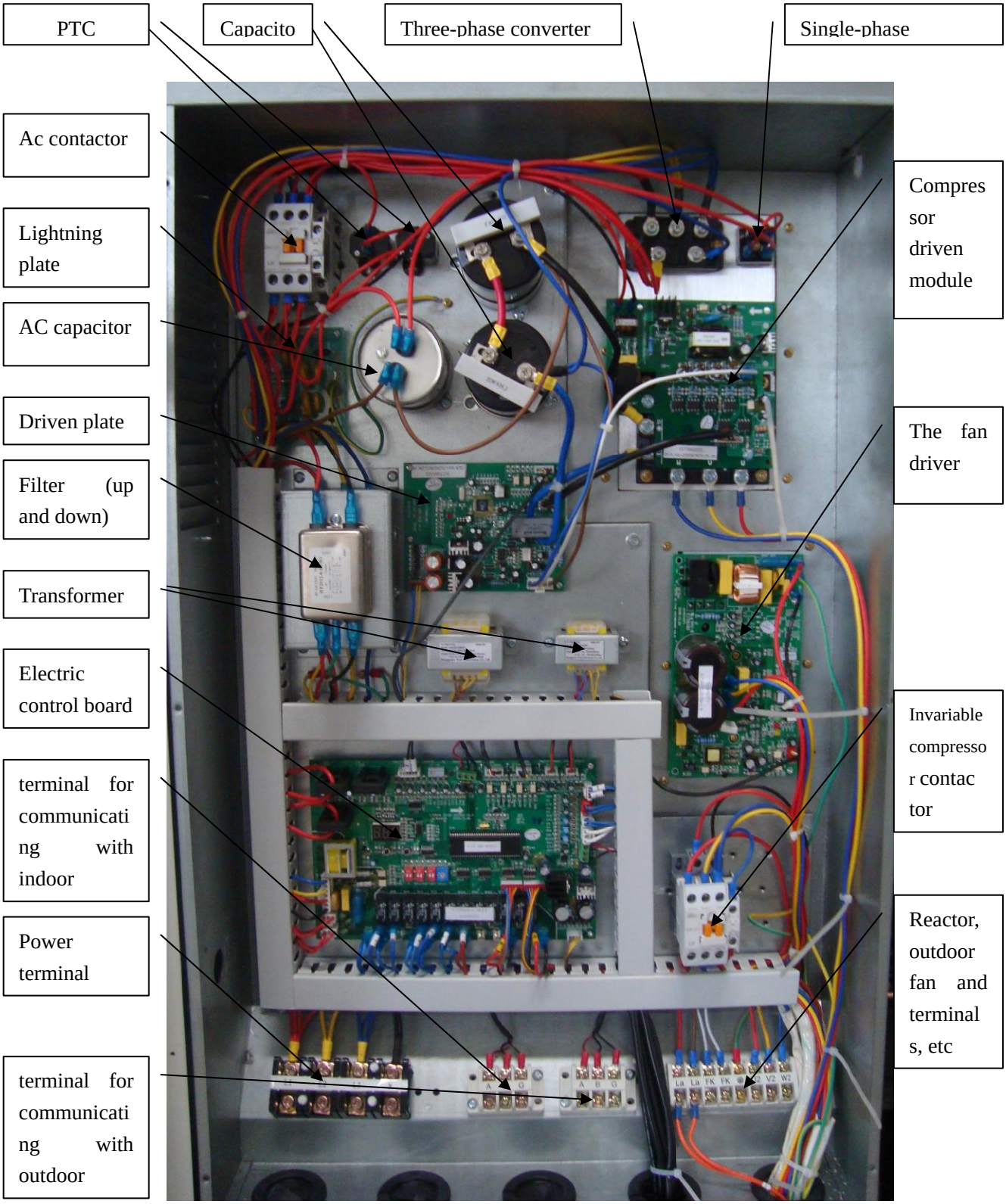
Defrosting operation while heating



2. Electric control principle

2.1. Electric control parts layout schematic

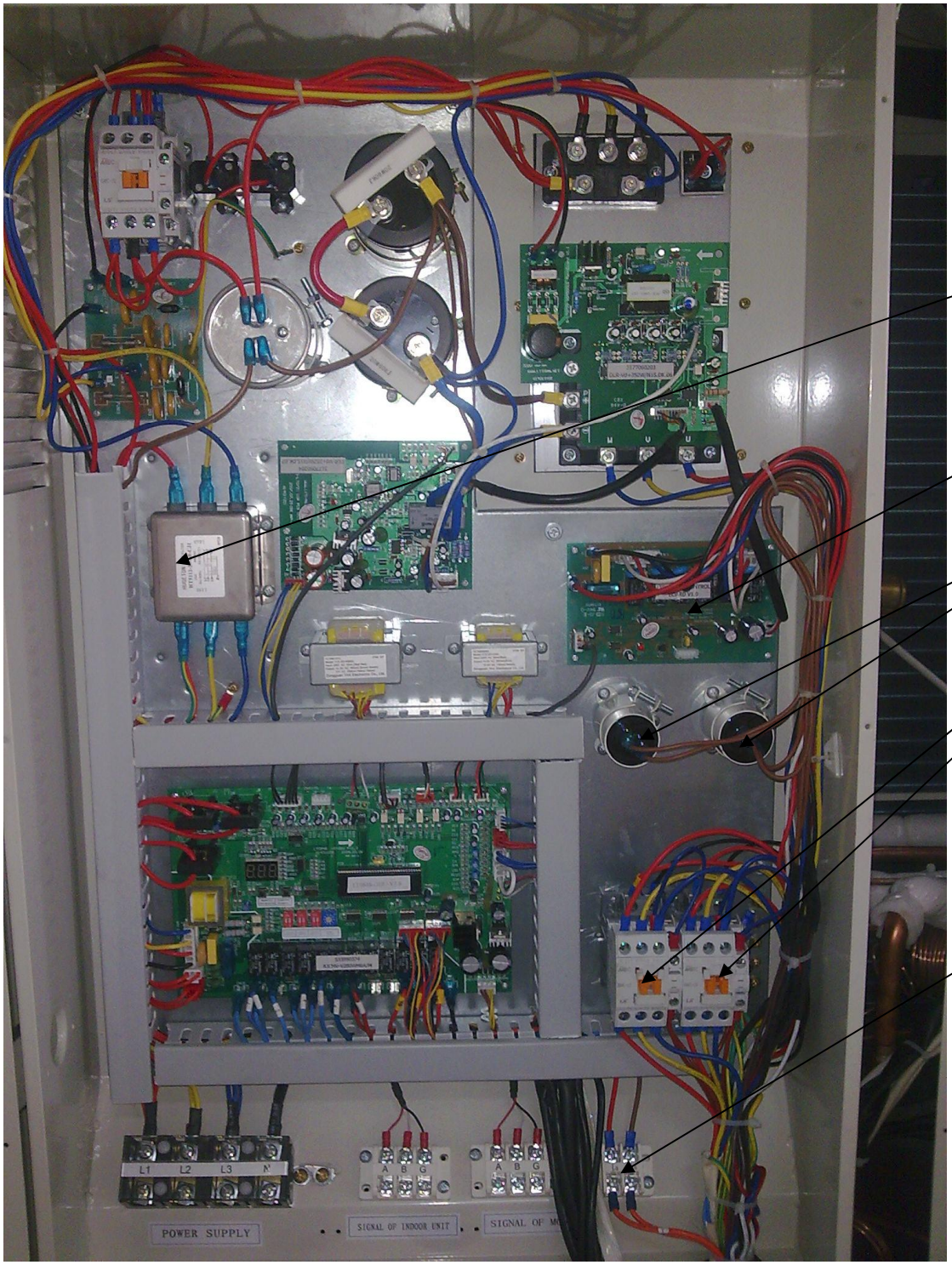
8HP、10HP outdoor unit control



12HP、14HP、16HP outdoor unit electric control

Note：The outdoor electric control system of 12HP、14HP、16HP are same with 8HP、10HP, only the fan driven system is different, as show below:

Note：12Hp only with one frequency compressor contactor。14HP、16HP with two，From left to right，the contactor of frequency compressor F1 and F2 is putted in proper order.



Filter （only one ）

Fan driver

Fan capacitance

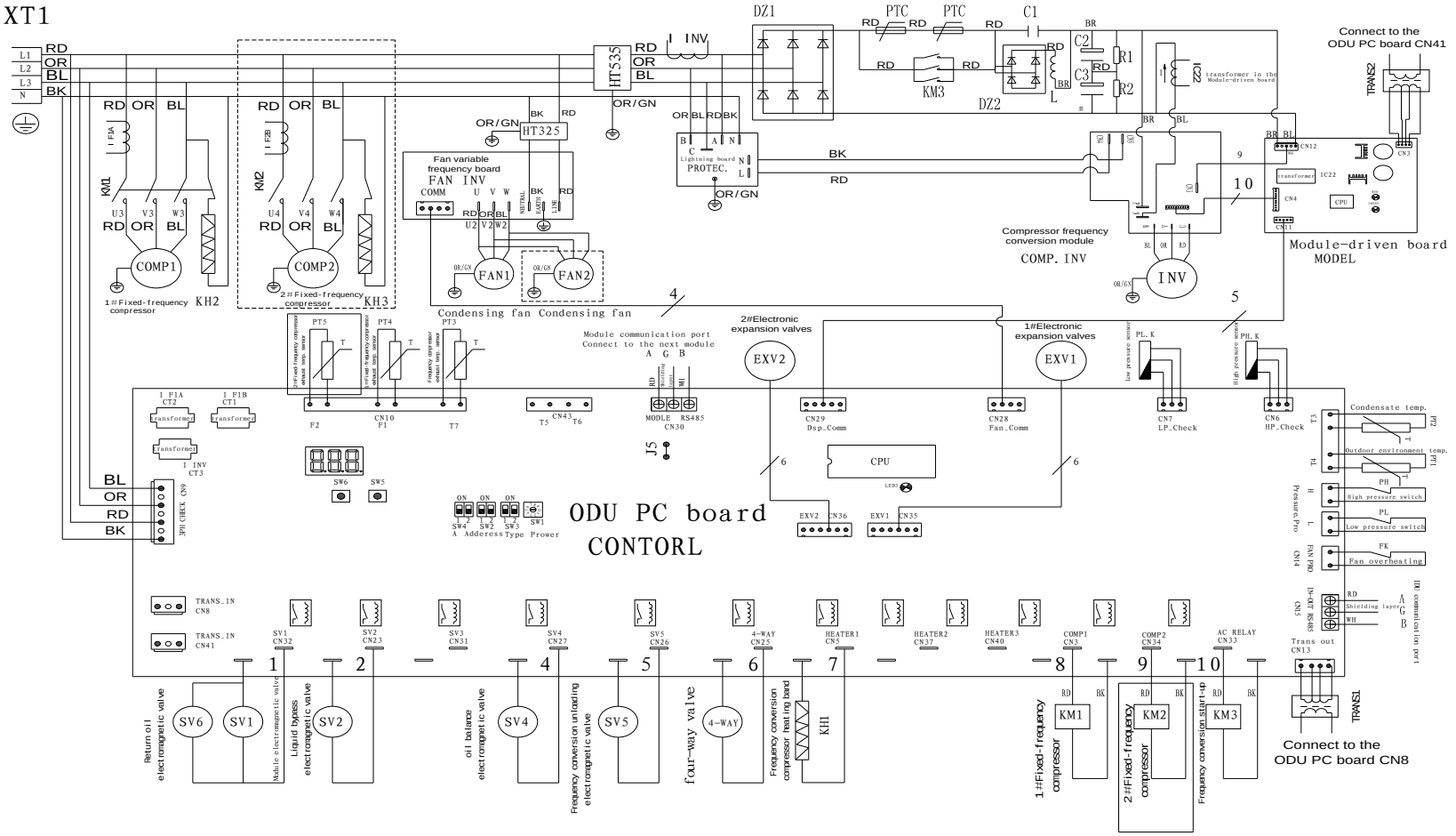
invariable compressor contactor

Reactor terminals

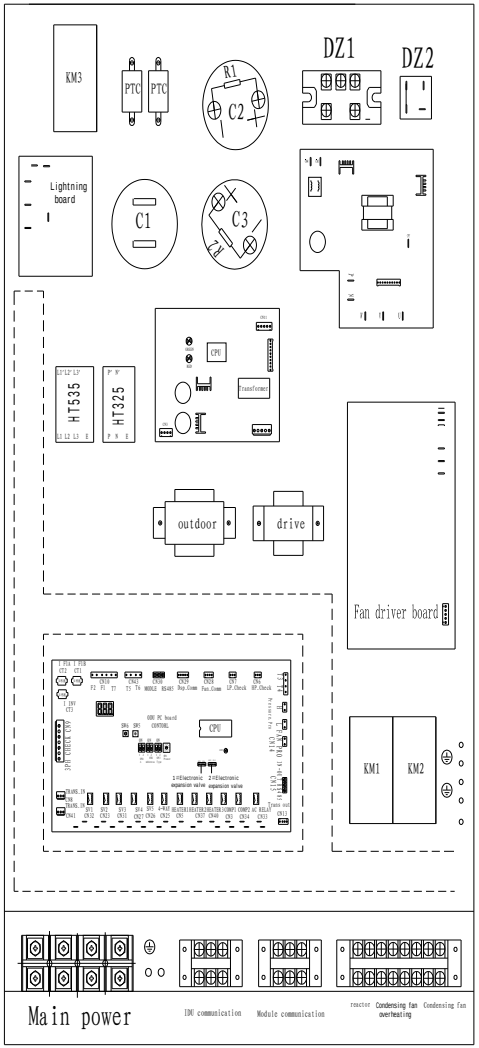
2.2. Electric appliances diagram

8HP、10HP System diagram

Note: Before maintenance comfirm that the power is blackouts more than 10 minutes, and C2 and C3 have discharge over.



Electrical components arrangement



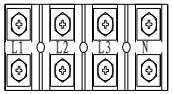
Unit Set	Name	Set range ON: 1 OFF: 0	remarks
SW1	Power choice (disc)	0, 1, 2, 3, 4 were respectively 8, 10, 12, 14, 16HP	Manufactured outside the scope of the actual power setting module reported fault
SW2	Module address selection	00: Host 01: 1#Slave 10: 2#Slave	Factory default 00, 11 as invalid, Module alarm Setting the scene according to the actual
SW3	Module quantity selection	00: Only host 01: Host and 1 slave 10: Host and 2 slaves	Factory default for 00 Discrepancies with the actual, host alarm Setting the scene according to the actual
SW4	Defrost parameter selection	00: A=5, B=40 11: A=3, B=30 Others are the same as 00	T3≤K*T4-A, K as the coefficients, A for the difference, B is the defrost cycle, T3 and B meet to enter defrosting
J5	Module communication port terminal resistor choice	Short circuit: a terminal resistance Disconnect: no termination resistor	Host is set to "short circuit" Slaves is set to "off"

SW5 for tally key-press, used for various points of view unit parameters

SW6 for compulsory refrigeration button, Please do not clicked in the normal operation;

XT2 XT3

XT1

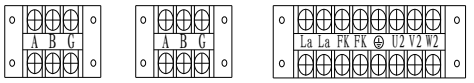


Main power

IDU communication port

Module communication port

XT4



IDU communication

Module communication

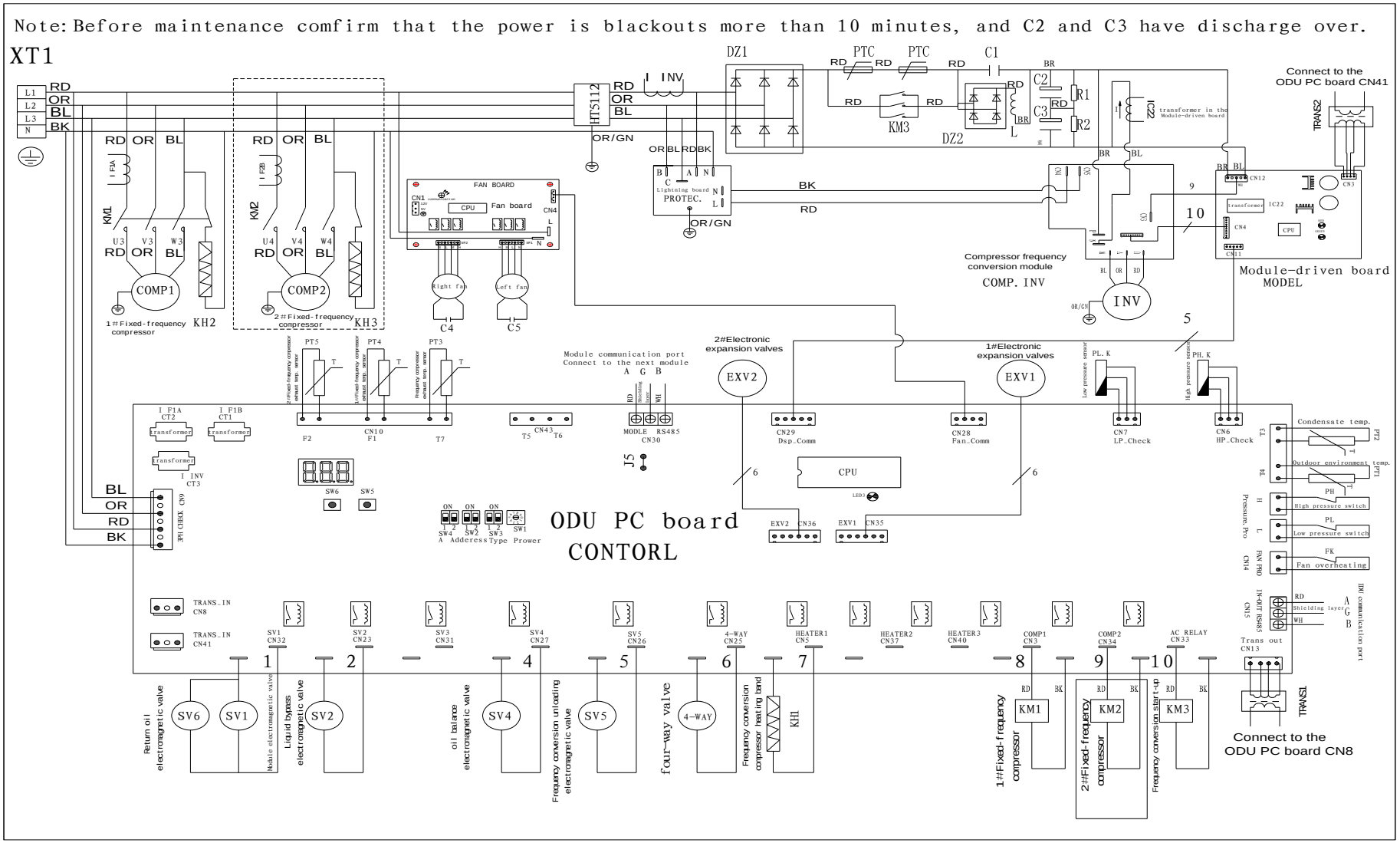
reactor Condensing fan Condensing fan overheating

Code description

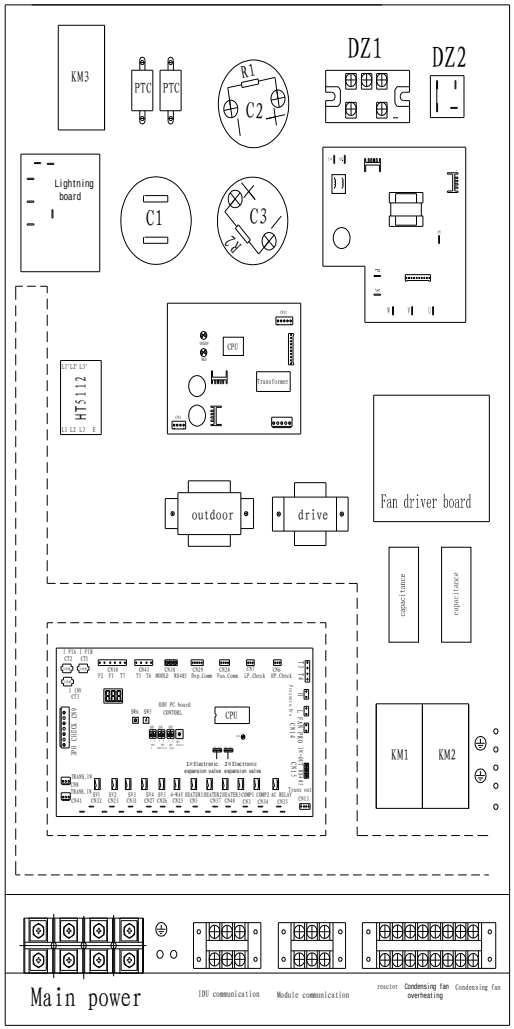
INV	Frequency compressor	PH.K	High pressure switch sensor
COMP1-2	Fixed-frequency compressor	PL.K	High pressure switch sensor
FAN1-2	Condensing fan	I INV	Frequency conversion compressor current transformer
4-WAY	Four-way valve	I F1A、IF1B	Fixed frequency compressor current transformer
SV1-5	Electromagnetic valve	DZ1	Three-phase bridge rectifiers
XT1-4	Terminal	DZ2	Single-phase Bridge Rectifier
KH1-3	compressor heating band	C1	AC Capacitor
KM1-3	AC contactor	C2、C3	Electrolytic capacitor
TRANS1-2	Transformer	L	reactor
PTC1-2	Thermistor	EXV1-2	Electronic expansion valve
PH	High pressure switch	PT1-5	Temperature sensor
PL	Low pressure switch	FK	Fan overheating
HT325	Single-phase filter	HT535	Three-phase filter

Note: unit power set to 14HP (including 14HP) above the dashed part is valid, IDU communication must connect to the host, cannot be connected to the slaves;

12HP、14HP、16HP System diagram



Electrical components arrangement



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SW2	Module address selection	00: Host 01: 1#Slave 10: 2#Slave	Factory default 00, 11 as invalid, Module alarm Setting the scene according to the actual
SW3	Module quantity selection	00: Only host 01: Host and 1 slave 10: Host and 2 slaves	Factory default for 00 Discrepancies with the actual, host alarm Setting the scene according to the actual
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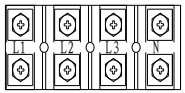
J5	Module communication port terminal resistor choice	Short circuit: a terminal resistance Disconnect: no termination resistor	Host is set to "short circuit" Slaves is set to "off"

SW5 for tally key-press, used for various points of view unit parameters

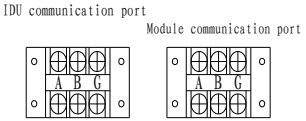
SW6 for compulsory refrigeration button, Please do not clicked in the normal operation;

XT2 XT3

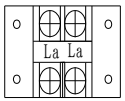
XT1



Main power



XT4



reactor

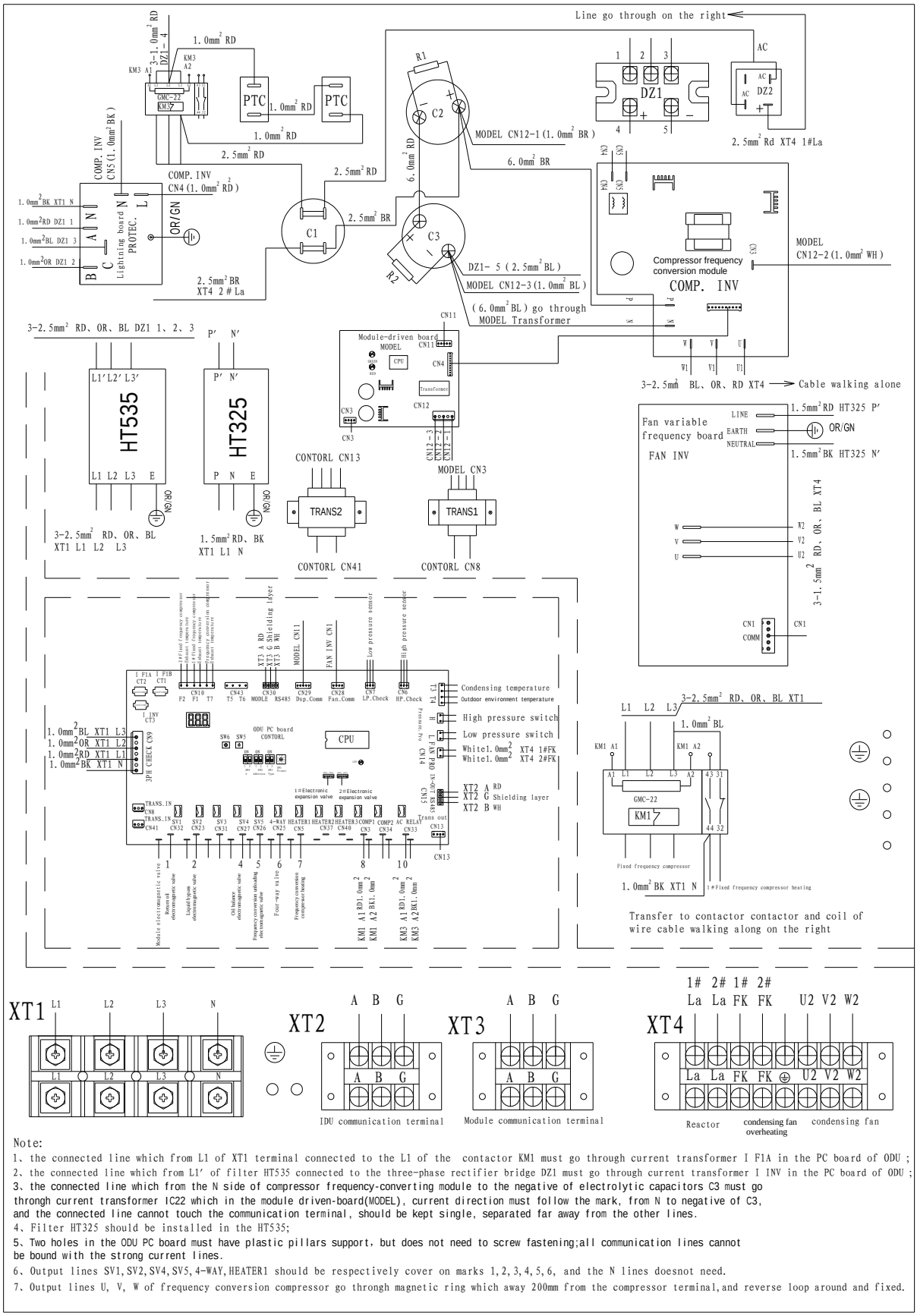
Code description

INV	Frequency compressor	PH.K	High pressure switch sensor
COMP1-2	Fixed-frequency compressor	PL.K	High pressure switch sensor
FAN1-2	Condensing fan	I INV	Frequency conversion compressor current transformer
4-WAY	Four-way valve	I F1A、IF1B	Fixed frequency compressor current transformer
SV1-5	Electromagnetic valve	DZ1	Three-phase bridge rectifiers
XT1-4	Terminal	DZ2	Single-phase Bridge Rectifier
KH1-3	compressor heating band	C1	AC Capacitor
KM1-3	AC contactor	C2、C3	Electrolytic capacitor
TRANS1-2	Transformer	L	reactor
PTC1-2	Thermistor	EXV1-2	Electronic expansion valve
PH	High pressure switch	PT1-5	Temperature sensor
PL	Low pressure switch	FK	Fan overheating
HT5112	Single-phase filter		

Note: unit power set to 14HP (including 14HP) above the dashed part is valid, IDU communication must connect to the host, cannot be connected to the slaves;

A: Electric appliances wiring diagram

B: 8HP、10HP Electrical wiring diagrams of modular unit control



Note:

1、the connected line which from L1 of XT1 terminal connected to the L1 of the contactor KM1 must go through current transformer I F1A in the PC board of ODU ;

2、the connected line which from L1′ of filter HT535 connected to the three-phase rectifier bridge DZ1 must go through current transformer I INV in the PC board of ODU ;

3、the connected line which from the N side of compressor frequency-converting module to the negative of electrolytic capacitors C3 must go throngh current transformer IC22 which in the module driven-board(MODEL), current direction must follow the mark, from N to negative of C3, and the connected line cannot touch the communication terminal, should be kept single, separated far away from the other lines.

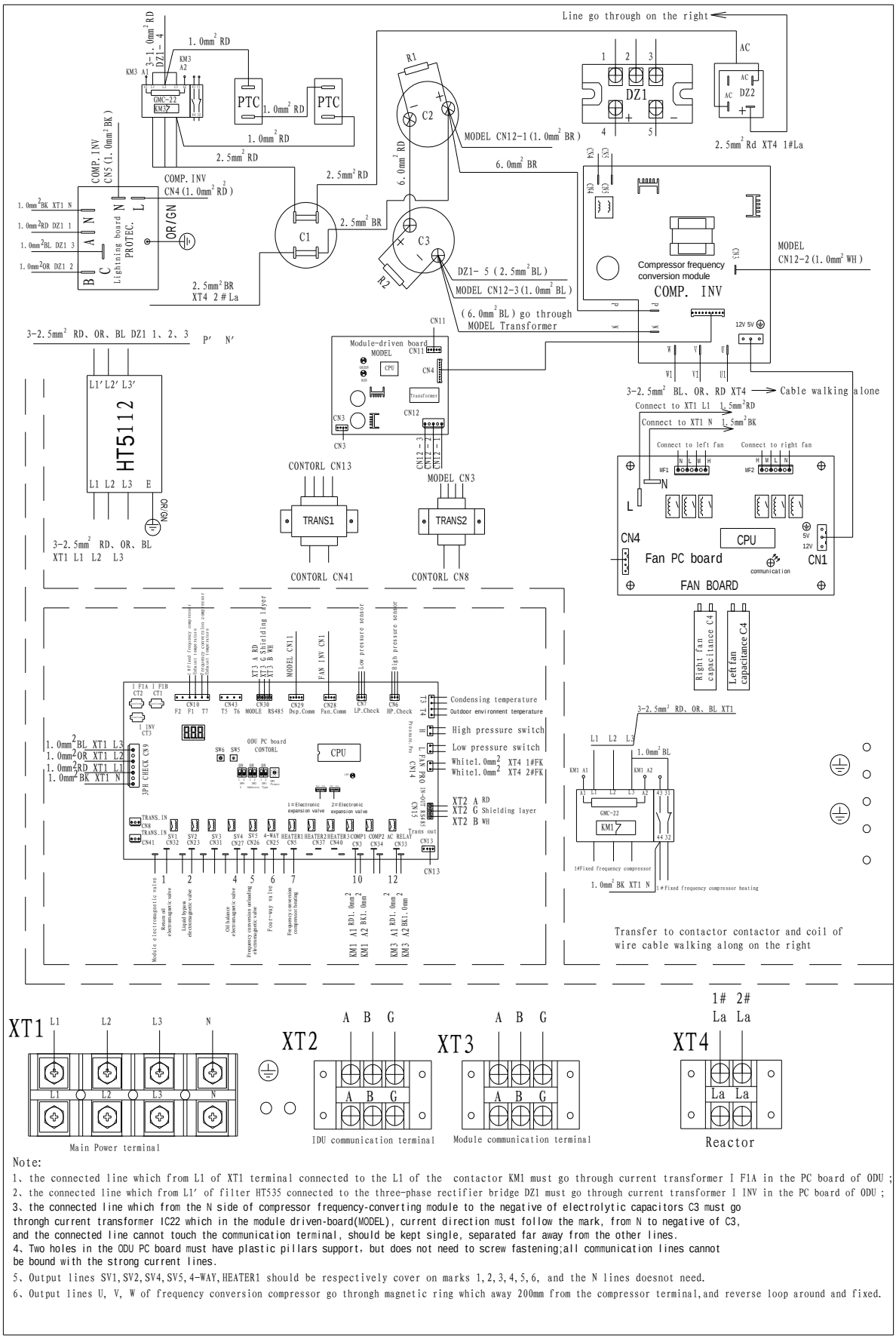
4、Filter HT325 should be installed in the HT535;

5、Two holes in the ODU PC board must have plastic pillars support, but does not need to screw fastening;all communication lines cannot be bound with the strong current lines.

6、Output lines SV1, SV2, SV4, SV5, 4-WAY, HEATER1 should be respectively cover on marks 1, 2, 3, 4, 5, 6, and the N lines doesnot need.

7、Output lines U, V, W of frequency conversion compressor go throngh magnetic ring which away 200mm from the compressor terminal, and reverse loop around and fixed.

C: 12HP Electrical wiring diagram of modular unit control



Note:

1、the connected line which from L1 of XT1 terminal connected to the L1 of the contactor KM1 must go through current transformer I F1A in the PC board of ODU ;

2、the connected line which from L1′ of filter HT535 connected to the three-phase rectifier bridge DZ1 must go through current transformer I INV in the PC board of ODU ;

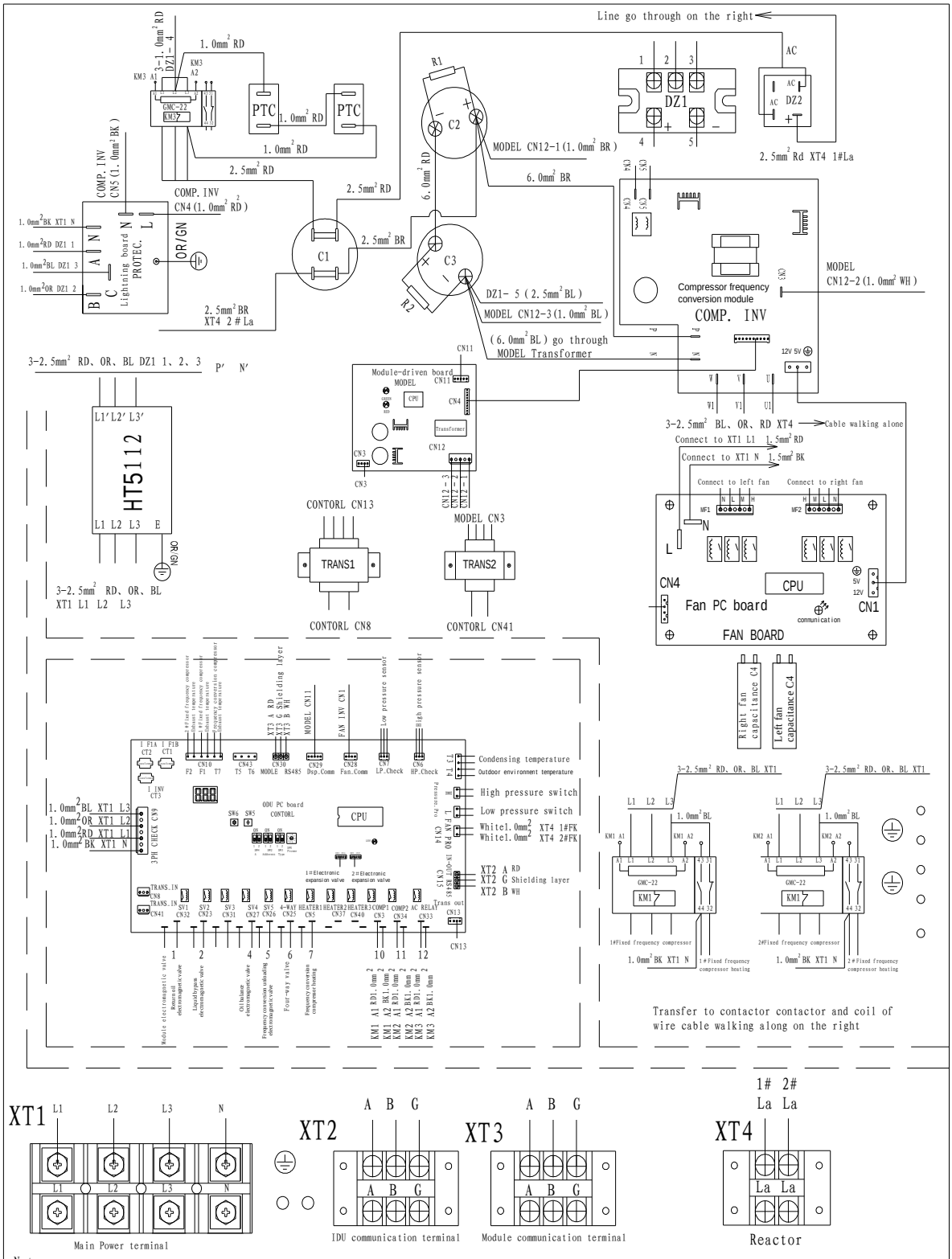
3、the connected line which from the N side of compressor frequency-converting module to the negative of electrolytic capacitors C3 must go throngh current transformer IC22 which in the module driven-board(MODEL), current direction must follow the mark, from N to negative of C3, and the connected line cannot touch the communication terminal, should be kept single, separated far away from the other lines.

4、Two holes in the ODU PC board must have plastic pillars support, but does not need to screw fastening;all communication lines cannot be bound with the strong current lines.

5、Output lines SV1,SV2,SV4,SV5,4-WAY,HEATER1 should be respectively cover on marks 1,2,3,4,5,6, and the N lines doesnot need.

6、Output lines U, V, W of frequency conversion compressor go throngh magnetic ring which away 200mm from the compressor terminal,and reverse loop around and fixed.

D: 14HP、16HP Electrical wiring diagram of modular unit control



Note:

1、the connected line which from L1 of XT1 terminal connected to the L1 of the contactor KM1 must go through current transformer I F1A in the PC board of ODU ;

2、the connected line which from L1 of XT1 terminal connected to the L1 of the contactor KM2 must go through current transformer I F2A in the PC board of ODU ;

3、the connected line which from L1′ of filter HT535 connected to the three-phase rectifier bridge DZ1 must go through current transformer I INV in the PC board of ODU ;

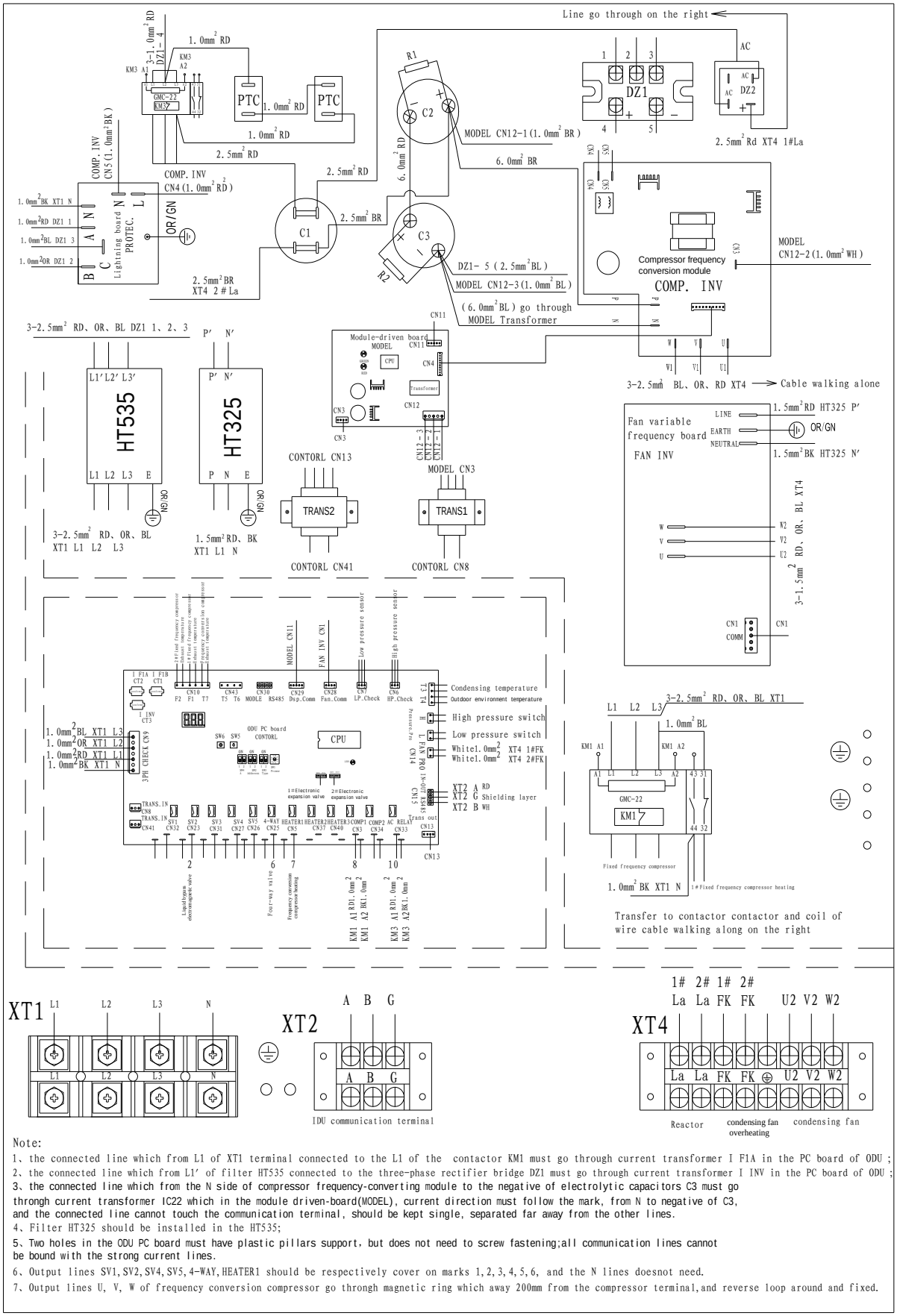
4、the connected line which from the N side of compressor frequency-converting module to the negative of electrolytic capacitors C3 must go throngh current transformer IC22 which in the module driven-board(MODEL), current direction must follow the mark, from N to negative of C3, and the connected line cannot touch the communication terminal, should be kept single, separated far away from the other lines.

5、Two holes in the ODU PC board must have plastic pillars support, but does not need to screw fastening;all communication lines cannot be bound with the strong current lines.

6、Output lines SV1,SV2,SV4,SV5,4-WAY,HEATER1 should be respectively cover on marks 1,2,3,4,5,6, and the N lines doesnot need.

7、Output lines U, V, W of frequency conversion compressor go throngh magnetic ring which away 200mm from the compressor terminal,and reverse loop around and fixed.

E: 8HP、10HP Electric appliances wiring diagram of Single type



Note:

1、the connected line which from L1 of XT1 terminal connected to the L1 of the contactor KM1 must go through current transformer I F1A in the PC board of ODU ;

2、the connected line which from L1′ of filter HT535 connected to the three-phase rectifier bridge DZ1 must go through current transformer I INV in the PC board of ODU ;

3、the connected line which from the N side of compressor frequency-converting module to the negative of electrolytic capacitors C3 must go throngh current transformer IC22 which in the module driven-board(MODEL), current direction must follow the mark, from N to negative of C3, and the connected line cannot touch the communication terminal, should be kept single, separated far away from the other lines.

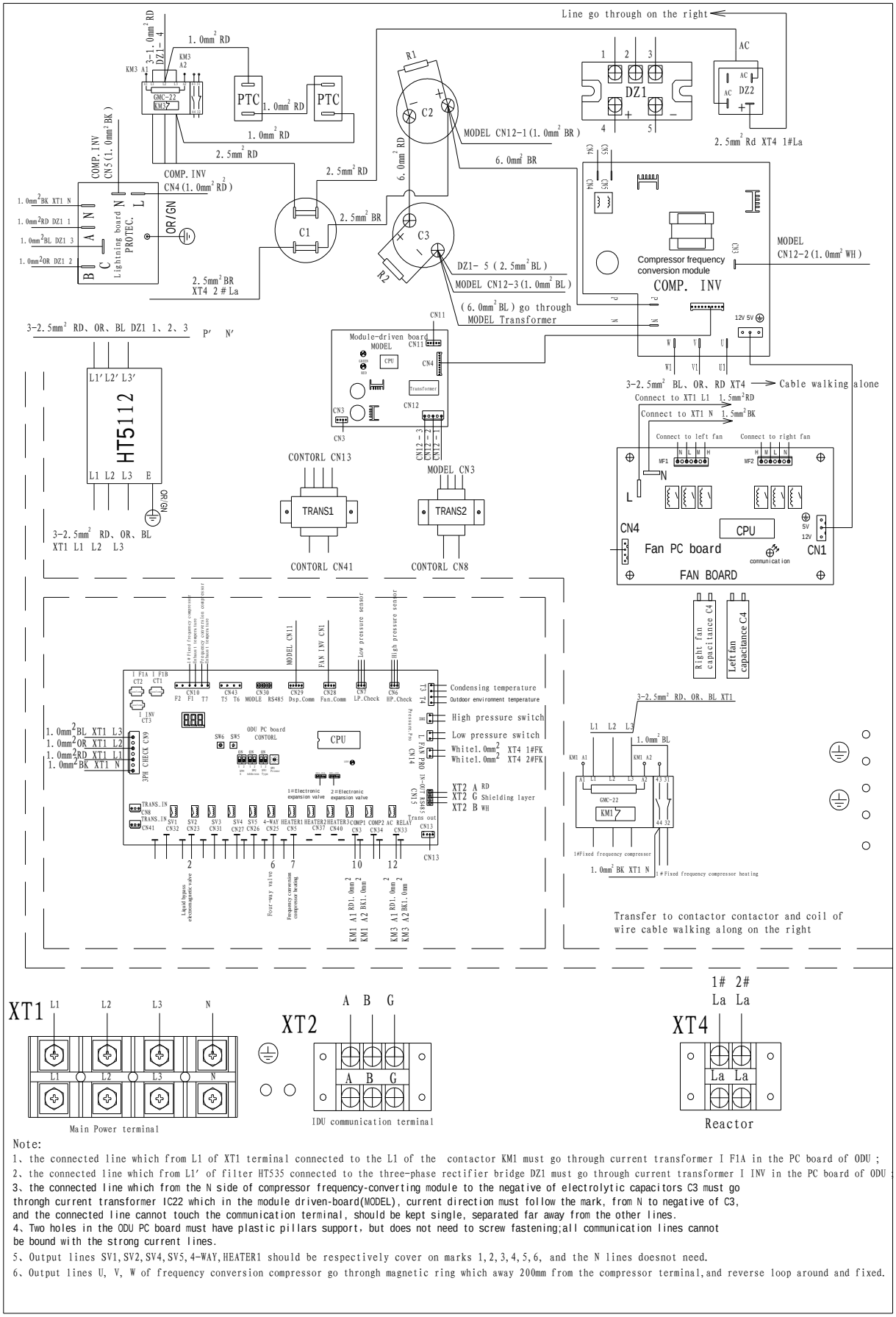
4、Filter HT325 should be installed in the HT535;

5、Two holes in the ODU PC board must have plastic pillars support, but does not need to screw fastening;all communication lines cannot be bound with the strong current lines.

6、Output lines SV1,SV2,SV4,SV5,4-WAY,HEATER1 should be respectively cover on marks 1,2,3,4,5,6, and the N lines doesnot need.

7、Output lines U, V, W of frequency conversion compressor go throngh magnetic ring which away 200mm from the compressor terminal,and reverse loop around and fixed.

F: 12HP Electric appliances wiring diagram of Single type



Note:

1、the connected line which from L1 of XT1 terminal connected to the L1 of the contactor KM1 must go through current transformer I F1A in the PC board of ODU ;

2、the connected line which from L1′ of filter HT535 connected to the three-phase rectifier bridge DZ1 must go through current transformer I INV in the PC board of ODU ;

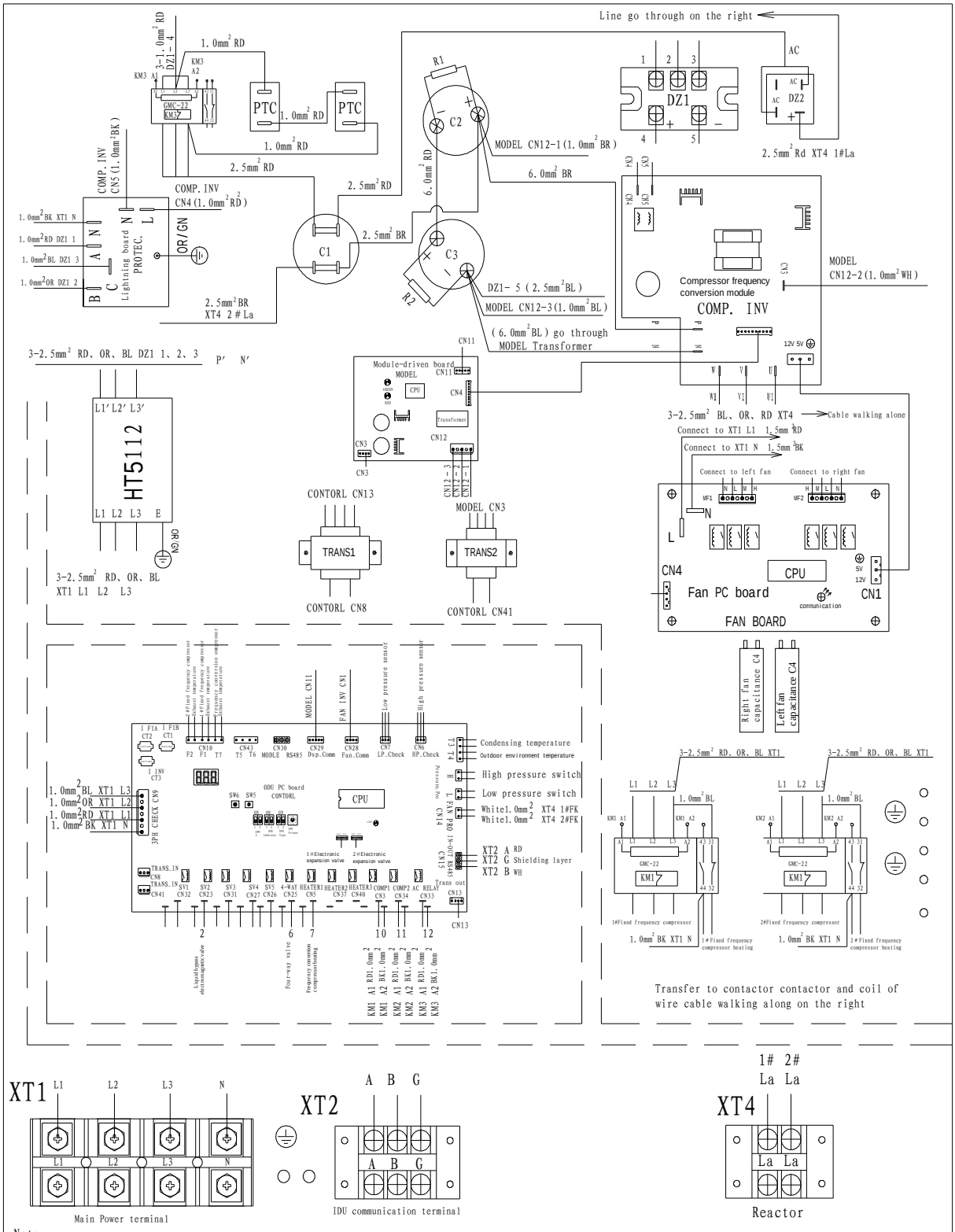
3、the connected line which from the N side of compressor frequency-converting module to the negative of electrolytic capacitors C3 must go throngh current transformer IC22 which in the module driven-board(MODEL), current direction must follow the mark, from N to negative of C3, and the connected line cannot touch the communication terminal, should be kept single, separated far away from the other lines.

4、Two holes in the ODU PC board must have plastic pillars support, but does not need to screw fastening;all communication lines cannot be bound with the strong current lines.

5、Output lines SV1, SV2, SV4, SV5, 4-WAY, HEATER1 should be respectively cover on marks 1, 2, 3, 4, 5, 6, and the N lines doesnot need.

6、Output lines U, V, W of frequency conversion compressor go throngh magnetic ring which away 200mm from the compressor terminal, and reverse loop around and fixed.

G: 14HP、16HP Electric appliances wiring diagram of Single type



Note:

1、the connected line which from L1 of XT1 terminal connected to the L1 of the contactor KM1 must go through current transformer I F1A in the PC board of ODU ;

2、the connected line which from L1 of XT1 terminal connected to the L1 of the contactor KM2 must go through current transformer I F2A in the PC board of ODU ;

3、the connected line which from L1′ of filter HT535 connected to the three-phase rectifier bridge DZ1 must go through current transformer I INV in the PC board of ODU ;

4、the connected line which from the N side of compressor frequency-converting module to the negative of electrolytic capacitors C3 must go throngh current transformer IC22 which in the module driven-board(MODEL), current direction must follow the mark, from N to negative of C3, and the connected line cannot touch the communication terminal, should be kept single, separated far away from the other lines.

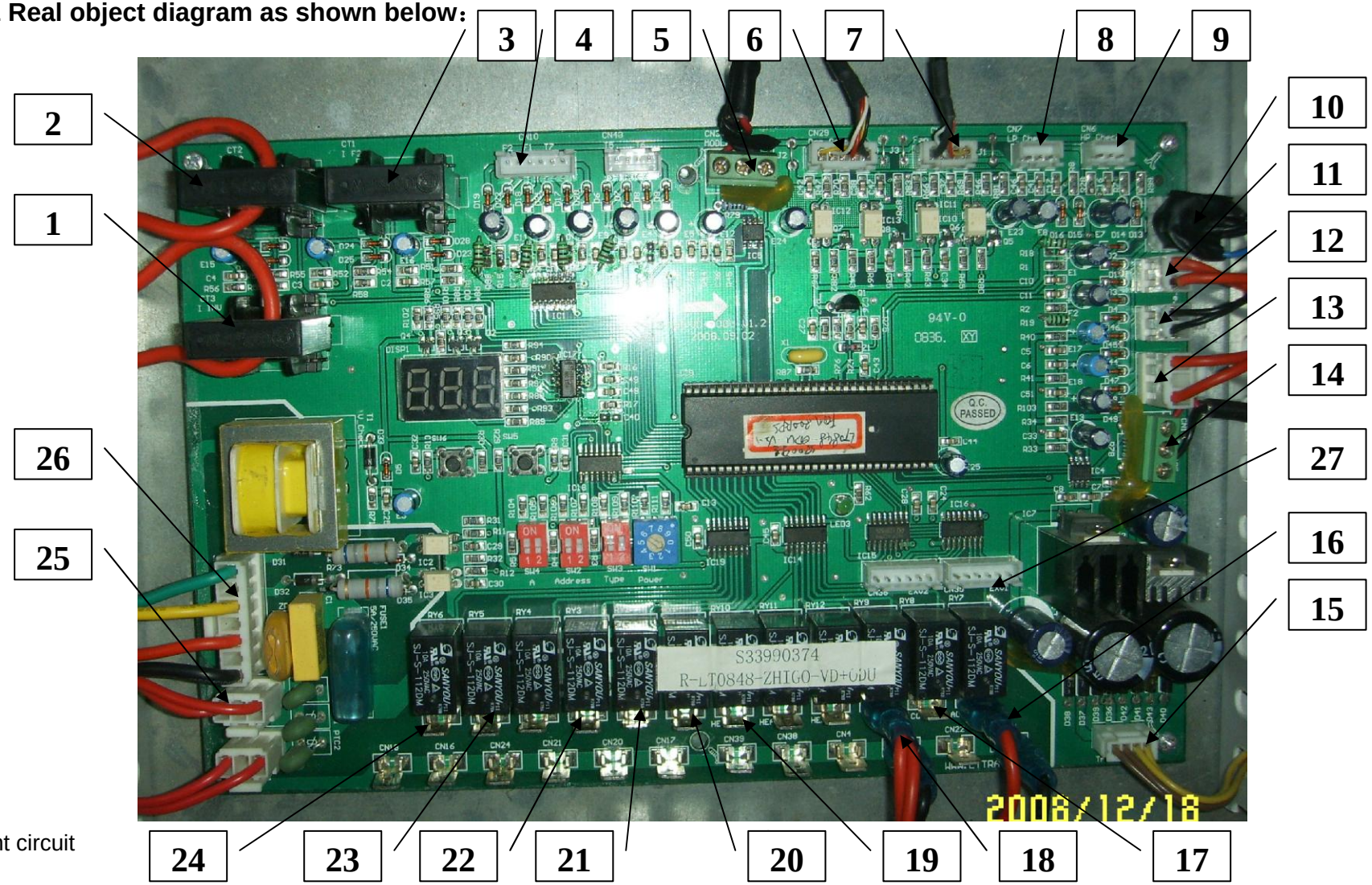
5、Two holes in the ODU PC board must have plastic pillars support, but does not need to screw fastening;all communication lines cannot be bound with the strong current lines.

6、Output lines SV1,SV2,SV4,SV5,4-WAY,HEATER1 should be respectively cover on marks 1,2,3,4,5,6, and the N lines doesnot need.

7、Output lines U, V, W of frequency conversion compressor go throngh magnetic ring which away 200mm from the compressor terminal,and reverse loop around and fixed.

2.3. The control board interface diagram

2.3.1 Real object diagram as shown below：



Refrigerant circuit

1: Interface specifications as below：
2: Variable frequency compressor current transformer
3: Fixed frequency compressor 1 current transformer
4: Fixed frequency compressor 2 current transformer
5: Exhaust temperature sensors socket
6: Communication interface of outdoor moduler
7: Socket for communicating with driver board
8: Socket for communicating with external fan driver board
9: Low pressure sensors socket
10: High pressure sensors socket
11: Room tube temperature sensors socket
12: High pressure switch socket
13: low pressure switch socket
14: External fan overload protection switch socket
15: Socket for communicating with indoor unit
16: Transformer secondary input port
17: Ac contactor interface
18: Fixed frequency compressor 2 contactor interface
19: Fixed frequency compressor 1 contactor interface
20: Oil and heat interface of variable frequency compressor
21: Four way valve interface
22: Variable frequency unloading electromagnetic valve interface
23: Oil balance electromagnetic valve interface
24: liquid side electromagnetic valve interface
25: Interface for Modular electromagnetic valve and return oil electromaganetic valve
26: The transformer primary socket
27: Three-phase power inspection hole
28: Outdoor electronic expansion valve socket

Part 4
Function

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1. Operation Mode

A. CMV - [V] DC inverter module multi-unit can be supported with multi-indoor unit; the operation mode in system is confirmed by which indoor unit start at first; if the requirement of later applying is not conform with current operation mode (Patterns conflict), then indoor unit will prompt non-prior and stop operation, the system operation mode conflict see the table as below.

System operating mode conflict

Application mode / Current mode	Cooling	Heating	Fan	Dehumidification	OFF
Cooling	NO	YES	NO	NO	NO
Heating	YES	NO	YES	YES	NO
Fan	NO	YES	NO	NO	NO
Dehumidification	NO	YES	NO	NO	NO
OFF	NO	NO	NO	NO	NO

B. When receiving heating operation signal in cooling、fan and dehumidification mode, the indoor controller displaying “non-prior”, after 3 minutes of clearing cooling、fan and dehumidification mode, outdoor unit may carry out the heating mode.

C. When receiving cooling、fan and dehumidification operation signal in heating mode, the indoor controller displaying “ non-prior”, after 3 minutes of clearing heating mode, outdoor unit may carry out the cooling、fan and dehumidification mode.

D. The preferred display method: when the conflict in mode, the indoor displaying panel shows that: running indicator is flashing for 3 times and stop for every five seconds.

2. Basic Control

2.1 Normal Operation

Part name	Control	
	Normal cooling	Normal heating
Compressor	High pressure protection、Low pressure protection、exhaust temperature control、over-current protection, etc.	High pressure protection, low-pressure protection、exhausted temperature control and over-current protection, etc.
Outdoor fan	According to the pressure to control	According to the pressure to control
Four-way valve	OFF	ON
Outdoor electronic expansion valves	480P	Regulating according to the compressor exhaust temperature
Modular electromagnetic valve	(ON)	(ON)
Liquid bypass electromagnetic valve	The exhaust temperature control	The exhaust temperature control
Inverter compressor of unloading solenoid valves	OFF	OFF
oil balance electromagnetic valve	Start by taking turns between modules	Start by taking turns between modules
Oil return electromagnetic valve	ON	（ON）

Operation of indoor unit action		Normal cooling	Normal heating
Fan	Starting indoor unit	Operate according to the specified wind speed	Operate according to the specified wind speed
	The indoor unit not yet been started	Not start	Not start
electronic expansion valve	Indoor unit been started	Regulate according to the evaporator temperatures	Regulate according to the evaporator temperatures
	The indoor unit not yet been started	（OFF）	Open the normally open step

2.2 Compressor Control

2.2.1 Cooling

In cooling mode, inverter compressor is starting after outdoor unit received boot order, the frequency is rise to 38Hz and operating for 5 min; after 5 min of operation, according to the capacity requirements, the compressor is operating with electric control designated frequency.

After inverter compressor starting, the fixed frequency compressor start operating in order by the size of capacity requirements.

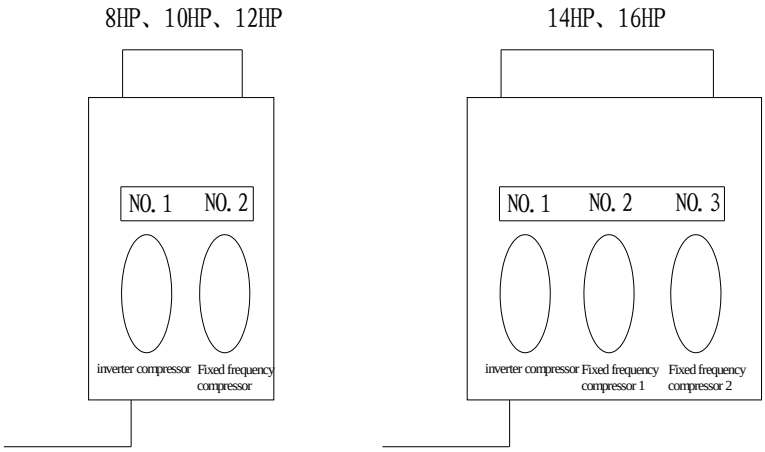
2.2.2 Heating

In heating mode, inverter compressor is starting after outdoor unit received boot order, the frequency is rise to 38Hz and operating for 5 min, after 5 min of operation, according to the capacity requirement, the compressor is operating with electric control designated frequency.

After inverter compressor starting, the fixed frequency compressor start operating in order by the size of capacity requirements.

2.2.3 The priority control of compressor operation

As for single module system, the compressor carry out the operation is according to the pattern of 1-3 as show below

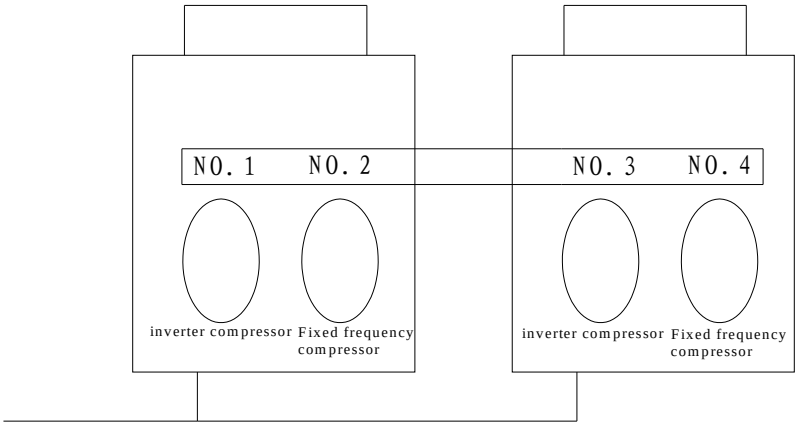


i. As for the outdoor system of two parallel modules, the compressor carry out the operation is according to the pattern of 1-5 as show below

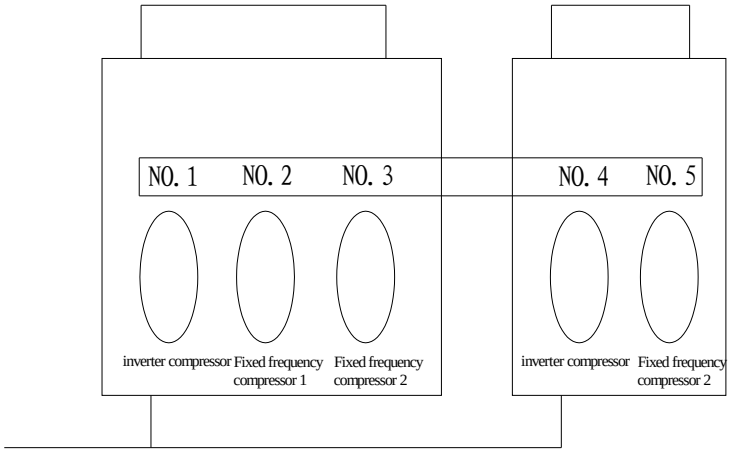
ii. Sum of indoor capacity requirements ≤ outdoor unit capacity, then operate host only according to the capacity requirements

iii. Sum of indoor capacity requirements ≥ outdoor host capacity, then operate the host and slave units, and share the indoor total capacity requirements equally among outdoor unit and slave unit by weighted.

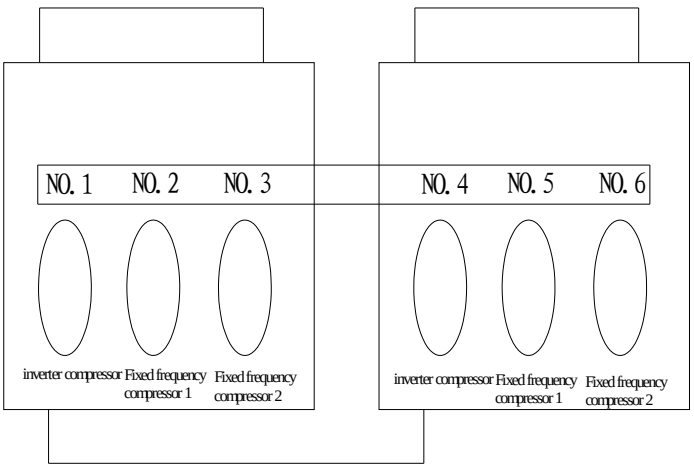
18HP、20HP、22HP、24HP



26HP



28HP、30HP、32HP



As for the outdoor system of three parallel modules, the compressor carry out the operation is according to the pattern of 1-9 as show below.

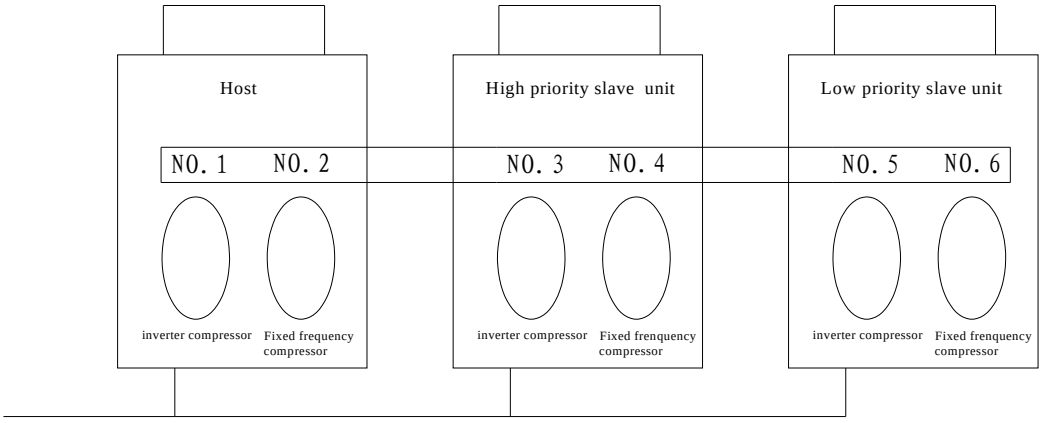
i. Sum of indoor capacity requirements ≤ outdoor host capacity, then according to capacity requirements, operate the host only.

ii. Sum of indoor capacity requirements ≥ sum of all outdoor modules capacity, then according to the capacity requirements, start all outdoor modules

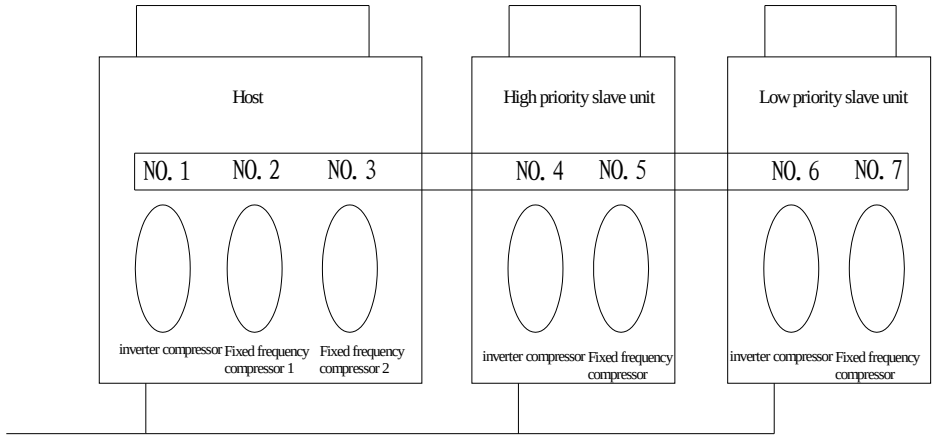
iii. Outdoor host capacity ＜sum of total indoor capacity requirements ≤ outdoor host capacity ＋ capacity of slave unit of less runtime, then share the total indoor capacity requirements equally among outdoor host and slave unit of less runtime by weighted.

Iv. Outdoor host capacity + capacity of salve unit of less runtime < sum of indoor unit capacity requirements ≤sum of all outdoor modules capacity, then share the total indoor capacity requirements equally among outdoor host and all salve unit by weighted.

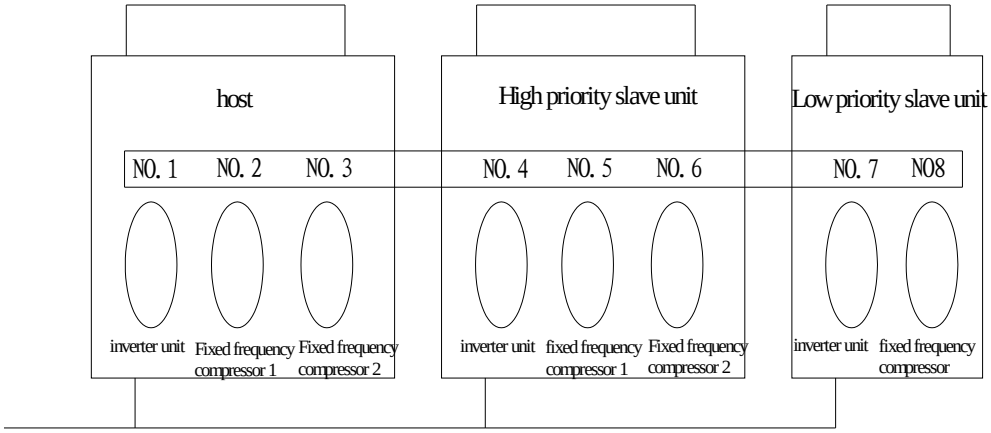
34HP、36HP



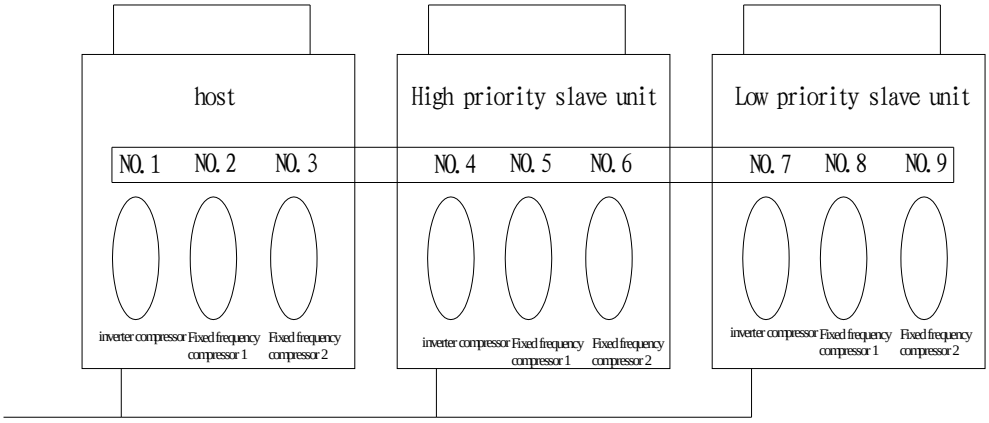
38HP



40HP、42HP、44HP



46HP、48HP



2.2.4. Inverter compressor control

The operating frequency of inverter compressor is calculated by a certain formula which according to the number of unit and the HP; then send the capacity to outdoor host and modules, share it equally by weighted, as for specific data can be checked out in parameters.(see the appendix two: outdoor unit of spot checking sequence list)

2.3. Outdoor electronic expansion valves control

Two 12VDC and 4-poles of electronic expansion valves are in the control of outdoor controller. the biggest opening is 480P, the smallest opening is 0P.

A. Cooling mode

Before the system starting, both outdoor electronic expansion valves of opening are 350P, after the inverter compressor starting, both electronic expansion valve of opening are 480P,After modules shutdown, the module electronic expansion valves of opening is closed to 0P.When the system is shutdown, all outdoor electronic expansion valves of opening are 350P

B. Heating

Before the system starting, both outdoor electronic expansion valve of opening are 350P. After the compressor operating, check each compressor of exhaust temperature, and according to the compressor exhaust temperature to regulate with a certain calculation method, After shutdown, the modular electronic expansion valves of opening is closed to zero,When the system is shutdown, all outdoor electronic expansion valve of opening is 350P

2.4 Outdoor condensate fan control

CMV - [V] DC inverter module multi-unit of outdoor condensate fan using inverter fan, the highest fan speed control can be achieved to seven- gear, precisely control the system heat exchange, so that the system can be operated best in any different conditions.

CMV - [V] DC inverter module multi-unit control is operated by pressure. According to system of suction pressure to regulate outdoor fan's speed, thus to achieve the purpose of precisely control system pressure, That make system running in the best working condition

2.5. Electronic Expansion Valve Control

Two 12VDC and 4-poles of electronic expansion valves are in the control of outdoor controller. the biggest opening is 480P, the smallest opening is 0P.

A. Cooling mode

Before the system starting, both outdoor electronic expansion valves of opening are 350P, after the inverter compressor starting, both electronic expansion valve of opening are 480P,After modules shutdown, the module electronic expansion valves of opening is closed to 0P.

When the system is shutdown, all outdoor electronic expansion valves of opening are 350P

B. Heating

Before the system starting, both outdoor electronic expansion valve of opening are 350P.

After the compressor operating, check each compressor of exhaust temperature, and according to the compressor exhaust temperature to regulate with a certain calculation method, After shutdown, the modular electronic expansion valves of opening is closed to zero, When the system is shutdown, all outdoor electronic expansion valve of opening is 350P

2.6. Cooling Operation Fan Control

CMV - [V] DC inverter module multi-unit of outdoor condensate fan using inverter fan, the highest fan speed control can be achieved to seven- gear, precisely control the system heat exchange, so that the system can be operated best in any different conditions.

CMV - [V] DC inverter module multi-unit control is operated by pressure. According to system of suction pressure to regulate outdoor fan's speed, thus to achieve the purpose of precisely control system pressure, That make system running in the best working condition

3. Special Control

3.1 Oil Return Operation

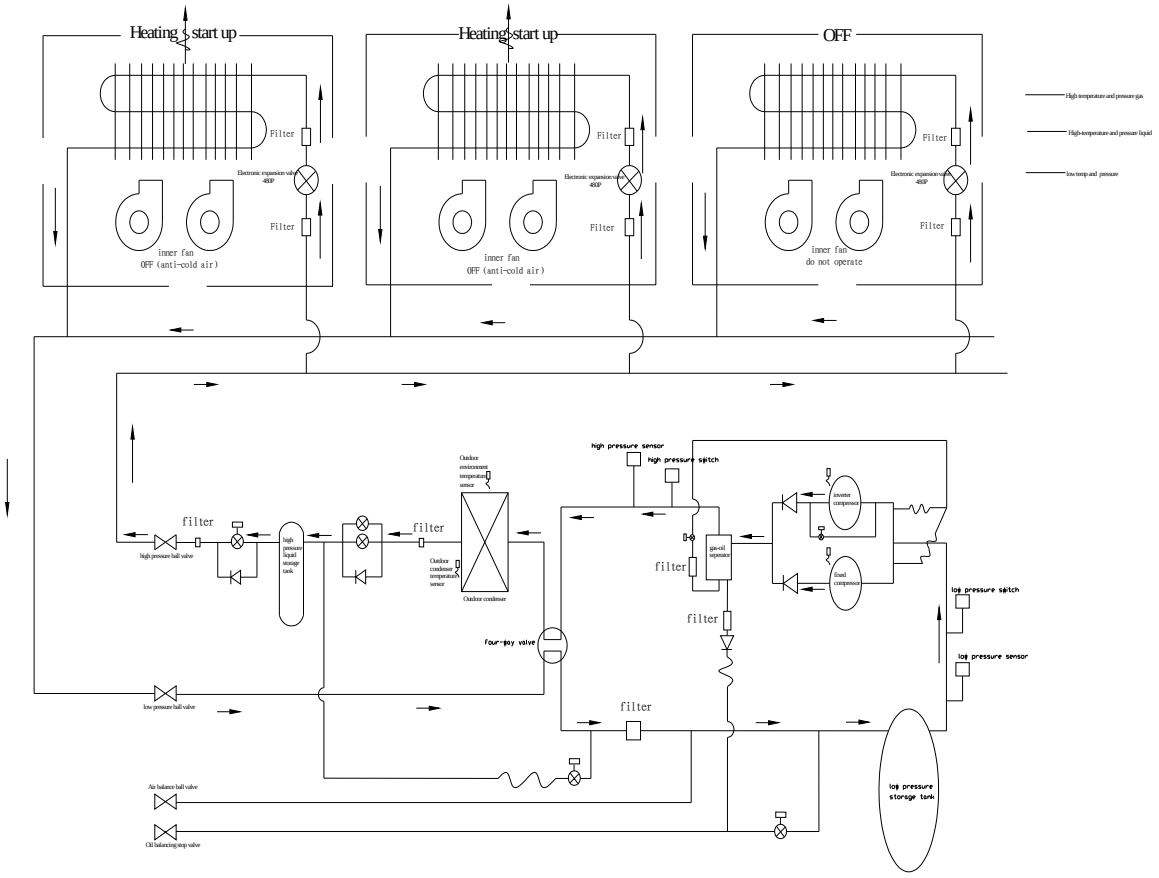
CMV - [V] DC inverter module multi-unit with it's feature of long pipe and with multi-indoor unit, in order to ensure the normal operation, it has been set a oil return program, so that system could promptly recovery the dispersive oil to outdoor unit, thus to ensure normal operation of compressor.

When the system executing oil return program, outdoor 3-digital tube displaying "d0" to prompt user.

3.1.1 Oil Return Operation in Cooling Operation

The oil recovery control is a fixed program in cooling mode, start the oil recovery control after system operating for 4 hours, the oil recovering time for 3 min.

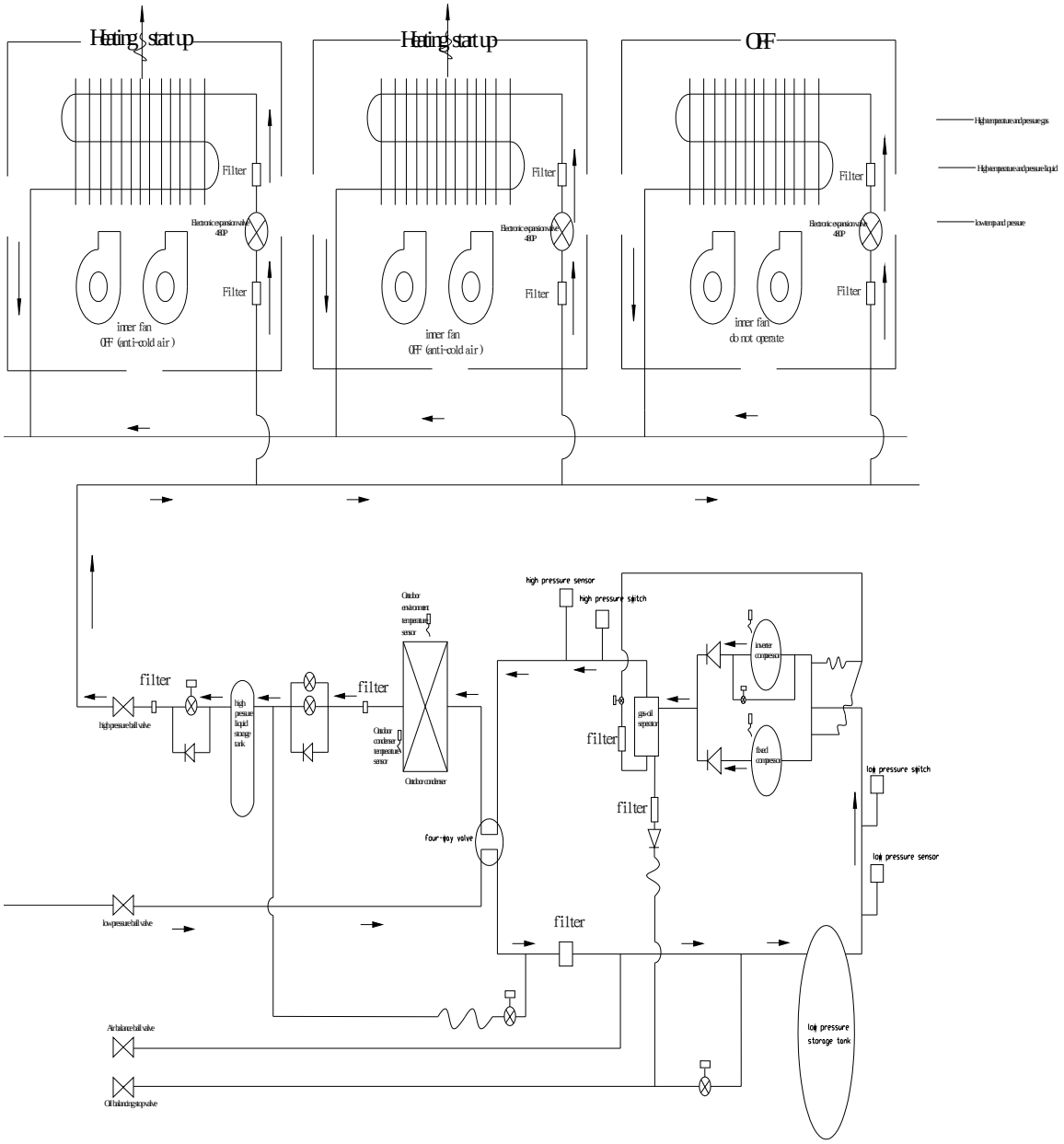
Oil return in cooling mode, operation of indoor unit: all indoor electronic expansion valve of largest opening is 480, indoor fan speed keep the original values unchanged. Operation of outdoor unit: all outdoor module electronic expansion valve of largest opening is 480P, and stating fixed frequency compressor to return oil. .(see the diagram as below: oil return control when cooling)



3.1.2 Oil Return Operation in Heating Operation

Oil recovery procedures is a fixed programs i n heating mode, system start oil recovery procedures after 2 hours of heating, operation of oil recovery control is 3 min.

When carrying out the oil return in heating mode, the operation of indoor unit: all indoor electronic expansion valve of largest opening is 480P, the indoor fan speed is controlled by the operation of anti-cold air. Outdoor unit: all outdoor electronic expansion valve of largest opening is 480P. start fixed frequency compressor to return oil.(see the diagram as below: oil return control when heating)



3.2 Defrosting Operation

In order to apply in various of frosting environment, the CMV - [V] DC inverter module multi-unit has beet set the function of automatic defrosting, system may operating parameters according to the environment, get into defrosting condition to adjust the operating states to achieve timely defrosting.

When defrosting, each functional component control of system is as follows:

Compressor: full open,

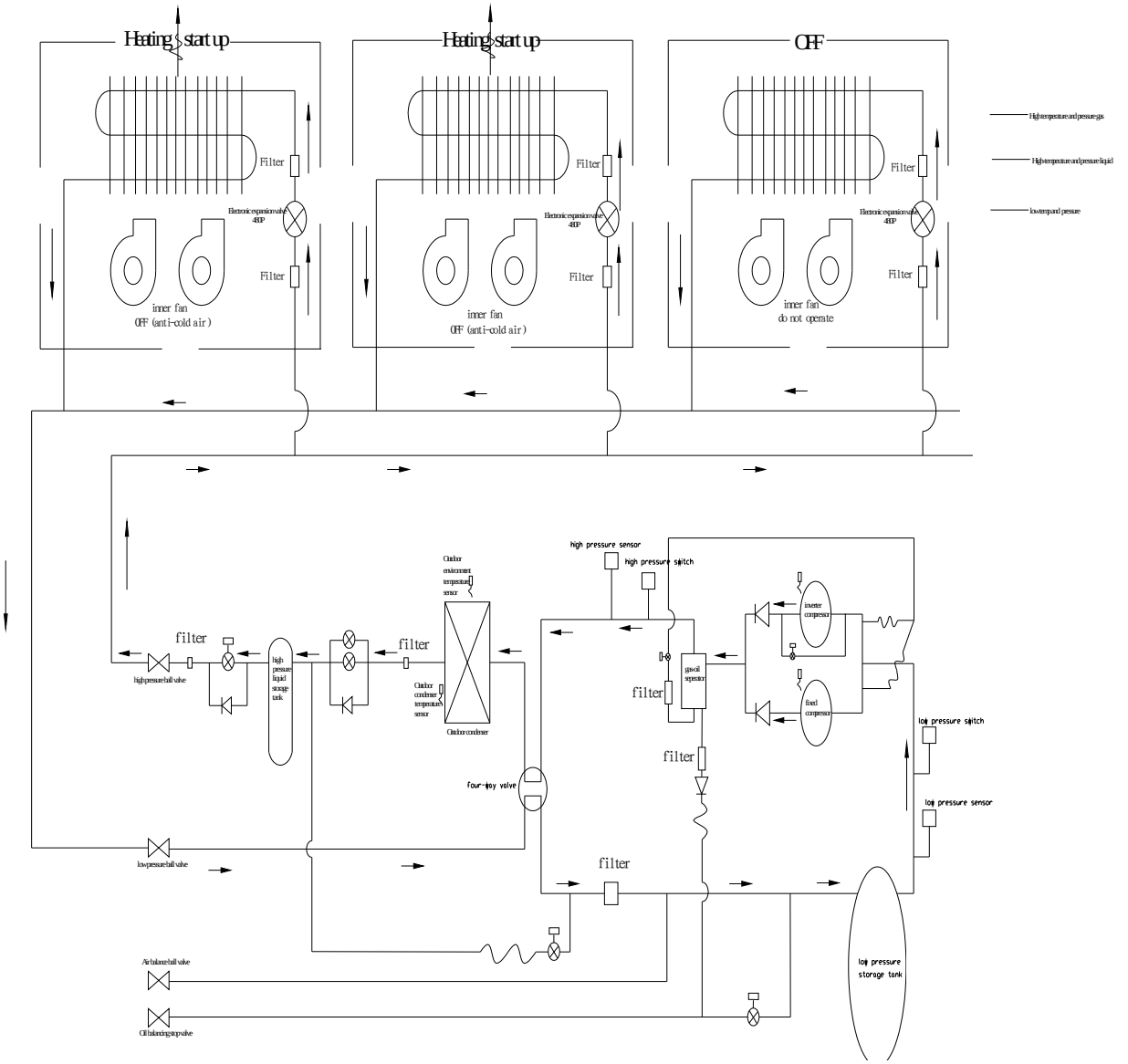
Outdoor fan: stop running

Outdoor electronic expansion valves, keep the original opening and do not adjust,

Indoor fan: control by the operation of anti-cold air

Indoor electronic expansion valves: the largest opening is 480 step,

When defrosting, each functional component of system and refrigerant flow diagram as show below



4. Protection Control

The operation condition of CMV - [V] DC inverter module multi-unit is complex, in actual use, Not only the piping length is different, also the service environment、capacity、quantity and fall of indoor unit is different as well. Outdoor system capacity with free match from the 8HP to 48HP. In order to apply to various working and installation environment, the system has been set many of the protection control to ensure the system always running in safety condition, as for specific, please refer to the protection control as below.

4.1 High Pressure Protection Control

The function of setting a high pressure protection control is to protect the compressor parts from damage when system running in high pressure.

CMV - [V] DC inverter module multi-unit of high pressure protection control as follows

A. Check system high pressure with high pressure sensor.

B. When pressure is higher than set value, The system will automatically lower output capacity until the pressure is lower than set value

C. When high pressure value reaches to a certain value, the compressor will stop operating in order to protect compressor from damage caused by high pressure.

D. When high pressure switch is tripping off, the compressor will stop operating in order to protect compressor from damage caused by high pressure.

4.2 Low Pressure Protection Control

CMV - [V] DC inverter module multi-unit has been set a low pressure protection control to protect system from low pressure when operating which caused by refrigerant leaking etc.

Low-pressure protection control as follows:

A. Checking system low pressure with low pressure sensor.

B. When low pressure is lower than set value, the system will reduce compressor output to maintain the low pressure

C. When low pressure is lower than a certain value, the compressor will stop operating to protect the compressor from damaged.

D. When low pressure switch is tripping off, the compressor will stop running to protect the compressor from damaged

4.3 Discharge Pipe Protection Control

In order to protect compressor from damaged which caused by the system refrigerant leaking, that may lead to high exhausted temperature, so, the compressor exhaust temperature protection control has been set to CMV - [V] DC inverter module multi-unit.

The exhaust temperature protection as follows:

A. Check every exhausted temp with exhaust temperature sensor.

B. When exhausted temperature reaches to a set value, the system will reduce compressor output in order to prevent exhaust temperature rising or compressor be damaged, when the exhaust temperature continues to rise, the system will start liquid bypass to carry out the forced cooling to compressor to protect it.
C. When the exhaust temperature reaches to a certain value, the compressor will stop to work in order to protect compressor from damaged which caused by high temperature.

4.4 STD Compressor Overload Protection

Each compressor has been set a over-current protection value, and carry out the detection to each compressor of running current, once the running current exceeds the protection value, then system will immediately close compressor to ensure that it is not burned, The current protection values is related to compressor。

5. Other Control

5.1 Outdoor unit operating time control

For maximum possible of using outdoor unit to extend the system service life, The operating time control has been set to outdoor unit to ensure that the same operating time among each outdoor unit.
Indoor unit of operating control as follows:
The system will automatically record the total running time of each module, whenever stating system, the startup sequence will be put in chronological order: namely preferentially start the module of less running time.

5.2. Demand Operation

Forced cooling control

For convenience of maintenance, debugging and refilling refrigerant etc operation, the forced cooling button has been set to system..
Forced cooling function as follows
A. Outdoor unit has been set a forced cooling button, if press the forced cooling button for 5S under the standby mode（running state is invalid）, then the system will send the forced cooling signal to all indoor unit to force it operating by cooling mode; all indoor units EXV of opening for 300P, indoor fan is operating by high speed.
B. In the forced cooling mode, push the forced cooling button again, the system exit compulsory cooling operation, and shutdown according to the normal procedure.
C. In the forced cooling conditions, if there is no any operation； then the system will automatically exit forced cooling after an hour and shutdown.

Part 5
Test Operation

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3.2 Field Setting from Outdoor Unit.....88

1. Test Operation

1.1. Procedure and Outline

The system test run CMV-[V] DC inverter module multi-line test run, the basis having two modes of cooling and heating test run, and must choose a combination of several typical test, specifically:

a、all terminal equipment must be up and running;

b、the system's most distant end of the device a separate test run;

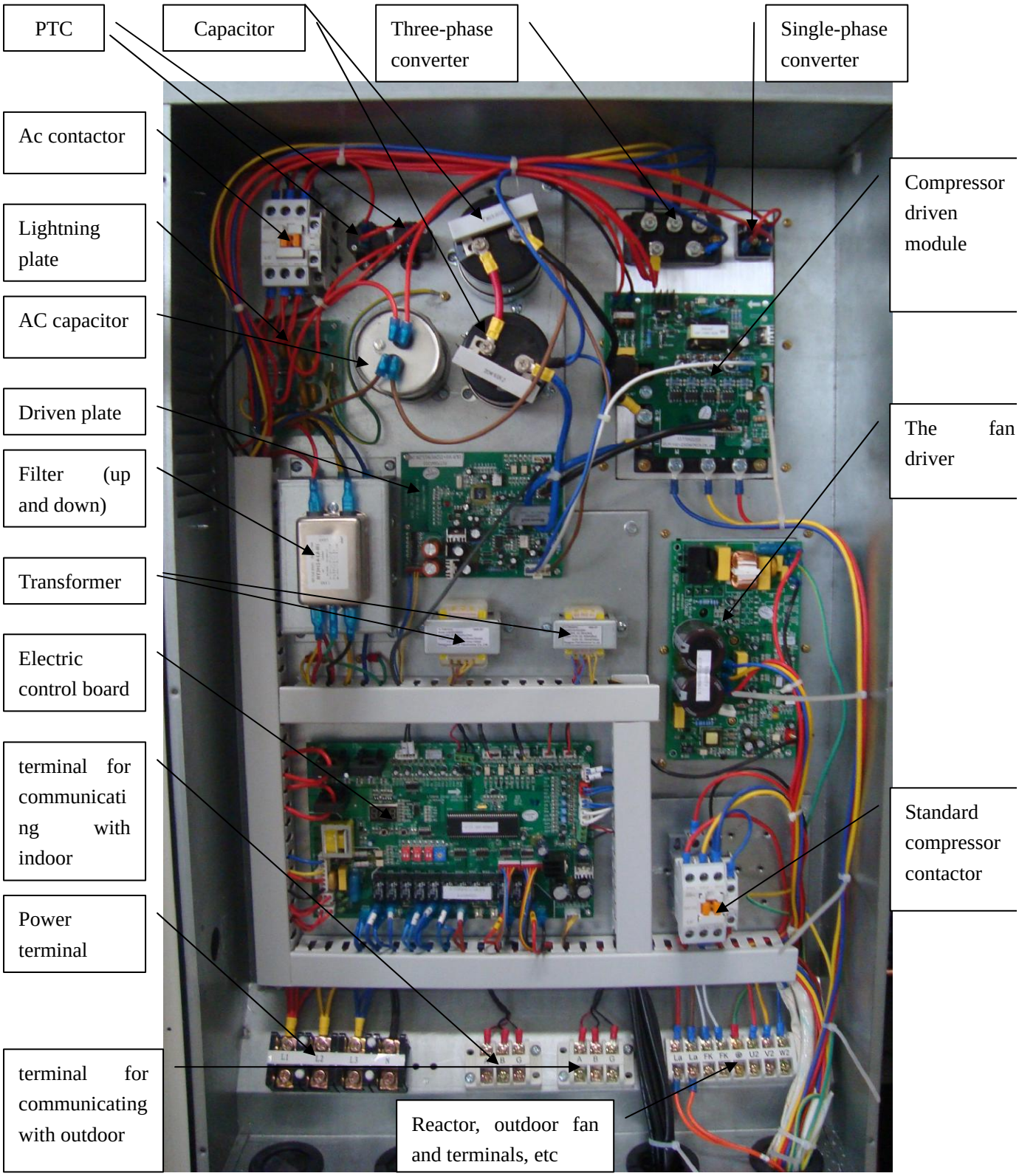
c、the system minimum operating capacity of the terminal equipment alone;

d、selected 2-3 center combination free commissioning;

Note: The running time for each test less than 2 hours, and fill out the commissioning record sheets; such as by the combination of tests, the indicators have reached HVAC Specifications (GB50243-97) in the request, to determine the commissioning qualified to acceptance;

2. Outdoor Unit PC Board Layout

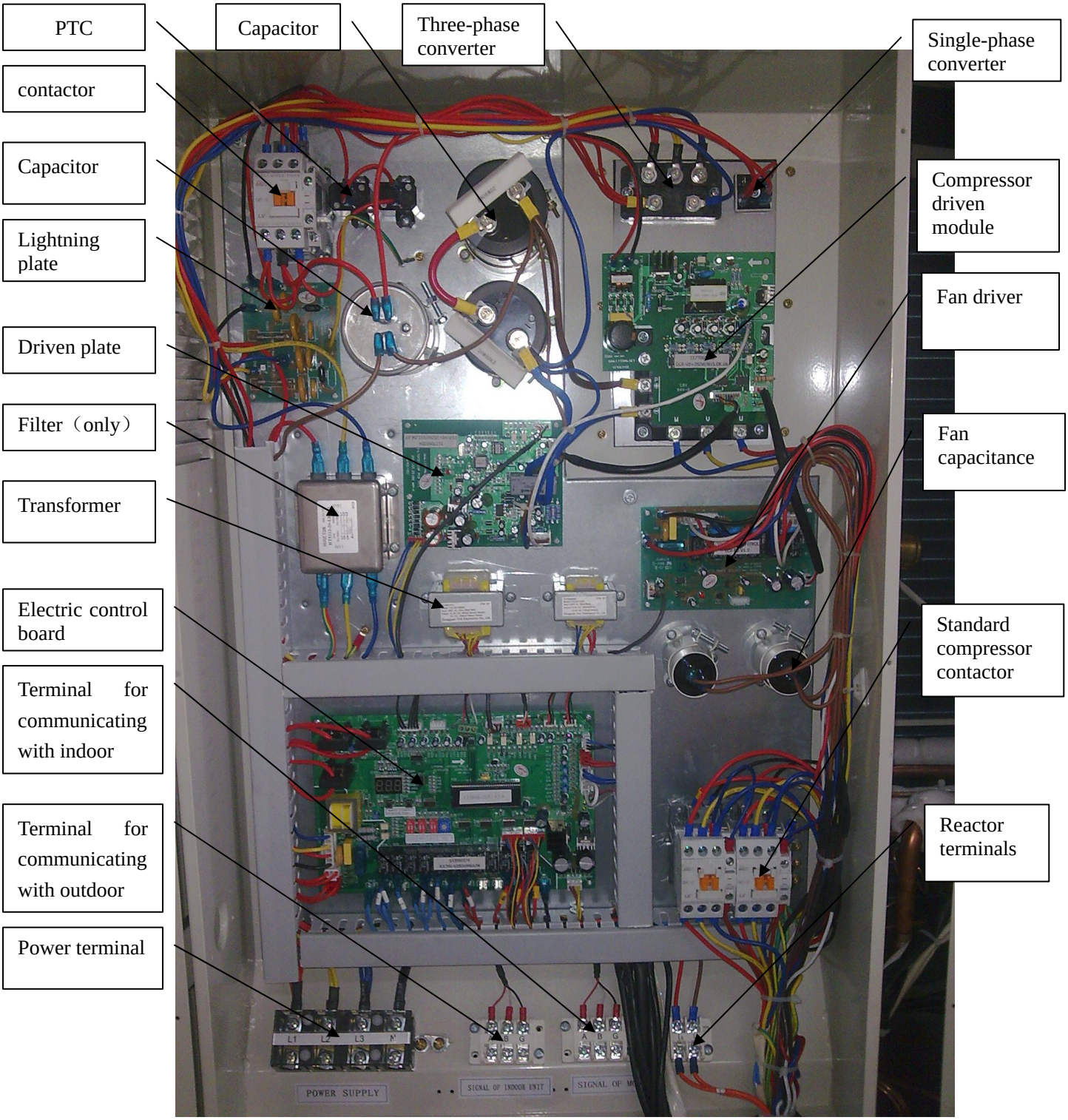
8HP、10HP outdoor unit control



12HP、14HP、16HP outdoor unit electric control

Note：The outdoor electric control system of 12HP、14HP、16HP are same with 8HP、10HP, only the fan driven system is different, as show below:

Note：12Hp only with one frequency compressor contactor。14HP、16HP with two，From left to right，the contactor of frequency compressor F1 and F2 is putted in proper order..

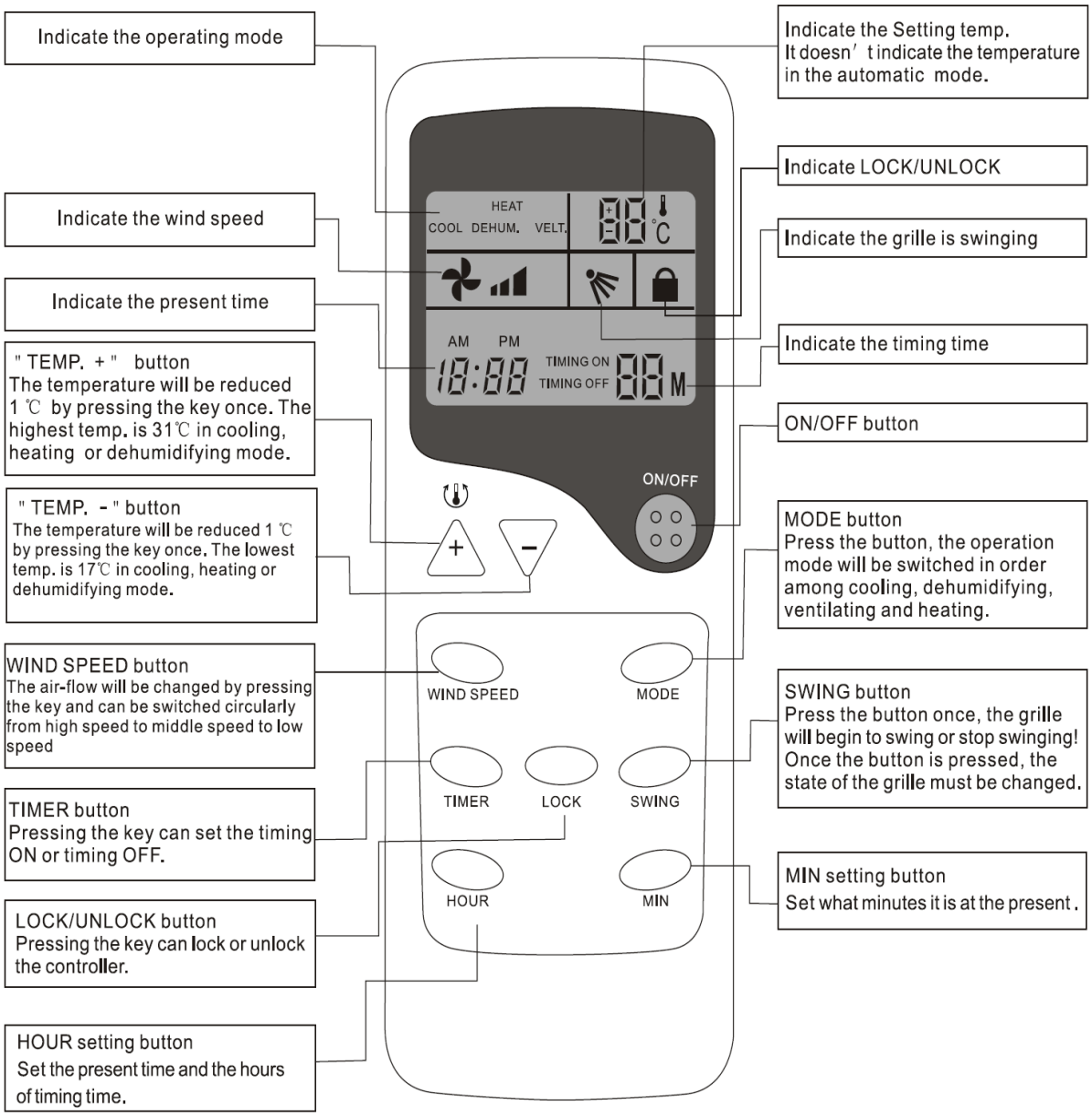


3. Field Setting

3.1 Field Setting from Remote Controller

Allocation of remote controller

Introduction of remote controller of Invert wall-mounted (Standard Collocated), Ceiling Cassette(Standard Collocated), Floor ceiling (Standard Collocated) , Fan coil (Alternative Collocated) and Ducting (Alternative Collocated)(Specification: LING TONG 20#) The usage is as follows.

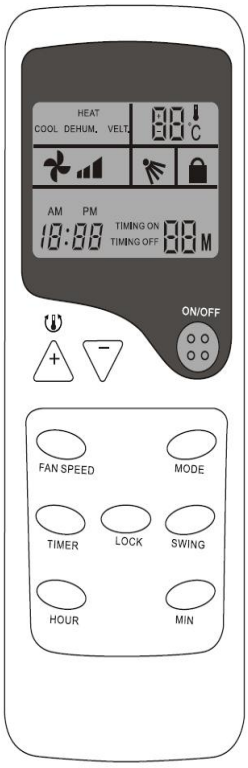

Indicate the operating mode
Indicate the Setting temp.
It doesn't indicate the temperature in the automatic mode.
Indicate LOCK/UNLOCK
Indicate the wind speed
Indicate the grille is swinging
Indicate the present time
Indicate the timing time
" TEMP. + " button
The temperature will be reduced 1 ℃ by pressing the key once. The highest temp. is 31℃ in cooling, heating or dehumidifying mode.
ON/OFF button
" TEMP. - " button
The temperature will be reduced 1 ℃ by pressing the key once. The lowest temp. is 17℃ in cooling, heating or dehumidifying mode.
MODE button
Press the button, the operation mode will be switched in order among cooling, dehumidifying, ventilating and heating.
WIND SPEED button
The air-flow will be changed by pressing the key and can be switched circularly from high speed to middle speed to low speed
SWING button
Press the button once, the grille will begin to swing or stop swinging! Once the button is pressed, the state of the grille must be changed.
TIMER button
Pressing the key can set the timing ON or timing OFF.
LOCK/UNLOCK button
Pressing the key can lock or unlock the controller.
MIN setting button
Set what minutes it is at the present .
HOUR setting button
Set the present time and the hours of timing time.
HEAT
COOL DEHUM. VELT.
AM PM
TIMING ON
TIMING OFF
ON/OFF
WIND SPEED
MODE
TIMER
LOCK
SWING
HOUR
MIN

Transmission method:

Aim the remote controller at the air condition and press the button, the signal will be sent to the air conditioner .

If the air conditioner receives the signal, it will make a sound of " di " .

Set the remote controller



1. Operation method under cooling /heating /ventilating) dehumidifying mode.

① Aim the remote controller at the air conditioner, press " **MODE** " key, make " ▼ " pointed to the mode you want [cooling/heating/ventilating/ dehumidifying]

② Press TEMP△ or ▽ key to set the temperature you want, the temperature range: 17℃~31℃;In cooling / heating mode, the difference is 5℃ between the temperature set and environment temperature , which is good for your health ;

③ Press WIND SPEED key to select the speed you want.

2. Wind direction adjustment

① Up/down adjustment: Press wind direction to adjust up or downwind direction .

② LEFT/RIGHT adjustment: Move left / right wind direction regulating vane to adjust the wind direction manually.(Applicable for wall -mounted)

NOTE:

① Please adjust left/right direction in the standby state.

② Keep your body from directly blowing for a long time.

③ Not adjust UP/DOWN air door (wall-mounted type) with your hand, or else once the control angle is changed, which leads that the air door can not be closed completely or does damage to parts.

3. Set the current time

After enclosing battery, the current time will set at AM12:00 automatically. If the current time is10:30am, do as follows:

① Press (please use the pinpoint or other similar object) CLK switch, " A.M " or " P.M " will be flashing.

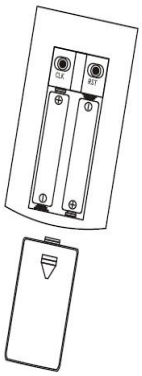
② Press the " HOUR " key continuously, adjust the time to " A.M 10 "（If the setting hours are more than 12 hours, " A.M " is changed into " P.M "）.

③ Press the " MIN " key continuously, adjust the time to " :30 " .

④ Press CLK key to exit from the setting.

The icon " A.M " Or " P.M " On the time indicator is changed from twinkling to the flashing.

Time set of pre-open (timing start) is supposed to the current time. So you should set the accurate current time.



Unload the rear cover

Notices for using the remote controller :

① Don′t place the remote controller near the heat resource, such as electric carpet and heating furnace.

② Don′t expose the remote controller under the sun.

③ Not drop it down, otherwise it will be damaged.

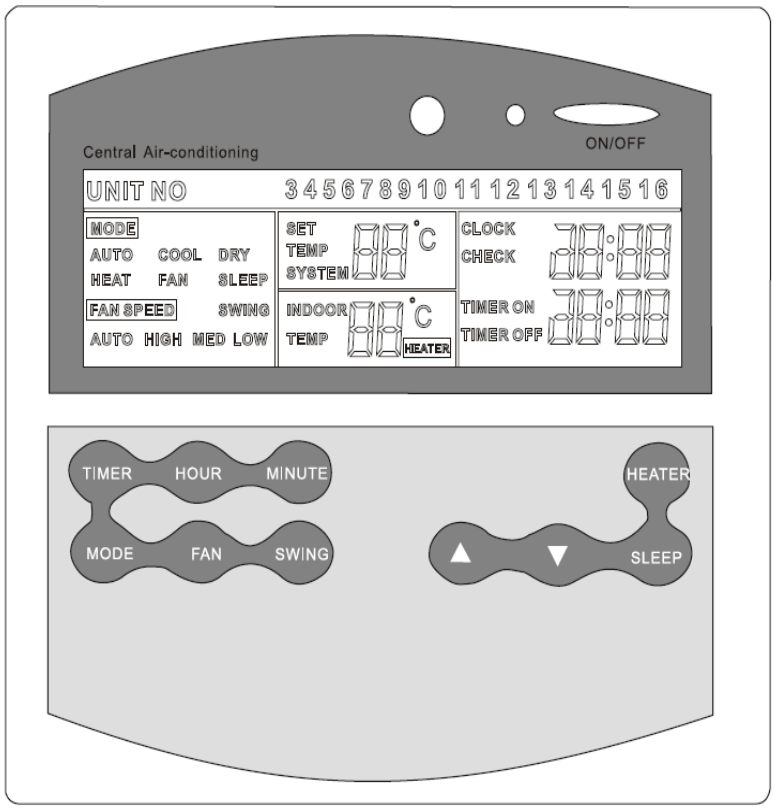
④ Not place the barrier between the signal receiver and remote controller, otherwise it will influence the sending and acceptance of the signal.

⑤ Don′t spatter the liquid like water to the remote controller.

⑥ Don′t lay the heavy thing on the remote controller.

NOTE: If the remote controller is disable, please repeat the operation once after changing new batteries, and if it is also disable, please contact the salesman or special maintenance service department.

Low ESP duct, middle ESP duct, high ESP duct



OPERATION and INDICATION

1. ON/OFF key

A. Press the ON/OFF key in the idle state, the wire controller will begin to run and the operation lamp is on. Besides, the LCD will indicate the present setting mode.

B. Press the ON/OFF key on running, the wire control will enter the standby state and the operation lamp is off. Besides, except system clock, the LCD won't indicate other latent function.

C. Pressing the ON/OFF key, the initial state will change from off to on and the wire controller delays sending the starting sign, the delay time is 5s.

D. If the running wire controller is cut off, the default state is off and will send off sign when the control is powered on again.

2. MODE key

A. When in the on state, pressing the MODE key on the wire controller or the MODE key of remote controller once, the mode will be changed in the following order:

COOL→DRY→FAN→HEAT →AUTO

B. In " COOL " mode, the sign of " COOL " on the LCD will be lightened. The adjusting range of the set temperature is from 16℃ to 31℃.

C. In " DRY " mode, the sign of " DRY " on the LCD will be lightened and the temperature isn't adjustable.

D. In " FAN " mode, the sign of " FAN " on the LCD will be lightened and the temperature isn't adjustable.

E. In " HEAT " mode, the sign of " HEAT " on the LCD will be lightened. The adjusting range of the set temperature is from 16℃ to 31℃.

F. " AUTO " mode is just as the " FAN " mode.

3. TIMER key:

A. The TIMER key can be used for set the system timer, on timer and off timer.

B. When starting, the system default timer is 0:00, it will be flashing or be reset if the " TIMER " key has been pressed for 3s in the working condition.

C. When the system timer is flashing, press " HOUR " key and the system clock will increase in hour; while pressing " MINUTE " key, the system clock will increase in minute.

D. Completing the system clock adjusted, press " TIMER " to affirm the timer which will be kept for all timer.

E. When the timer of Timing ON/OFF is flashing, press " HOUR " key and the system clock will increase in hour. Pressing " MINUTE " key, the system clock will increase in minute. The present timer minus the off timer is the system timing timer.

F. Once the " TIMER ON " and " TIMER OFF " set at the same put on effect, they will be indicated in turn.

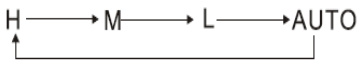
G. Setting the " TIMER OFF " in the ON state, the wire control will be closed and the timing off function will also be cancelled when pressing the " ON/OFF " key.

H. Setting the " TIMER ON " in the OFF state, the wire control will work and the timing on function will also be cancelled when pressing the " ON/OFF " key.

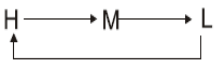
4. FAN SPEED key

A. The FAN SPEED key works in the modes of " AUTO ", " HEAT ", " COOL " and " FAN "

B. When some mode works, pressing the FAN key of the wire controller or the " AREFLOW " key of remote control once, the airflow will be changed in the following order:



C. In the " FAN " mode, there is no automatic wind and the volume will be changed in the order :



5. SWING key

A. When the system is powered on, the default function " SWING " mode is closed.

B. When SWING mode is closed, if you press SWING key of the remote controller or that of the wire controller , it will be opened up and the LCD will indicate the SWING sign .

C. Press SWING key of the remote controller or that of the wire controller again, the function of " SWING " will be cancelled and there is no indication of the SWING sign .

6. " ▲ " and " ▼ " key

A. In cooling mode or heating mode, the temperature is adjustable.

B. When some mode works, the temperature will rise by pressing " ▲ " key. The temperature will no longer got increased at 31℃.

C. When some mode works, the temperature will be decreased by pressing " ▼ " key. The temperature will no longer be decreased at 16℃.

7. System initialization

A. When the wire controller is powered on, it will begin to be initialized. All characters will be indicated on the screen of LCD and kept for two seconds.

B. Under the open state, the wire controller will automatically identify which model it is (Double temperature type or cold-only type) according to the setting of the indoor unit.

3.2 Field Setting from Outdoor Unit

3.2.1 Outdoor units address setting

As for DC Inverter VRF system, the maximum amount of the outdoor units running in parallel is three and it needs to set the correct address of outdoor units.

The address dialing switch with two numbers of outdoor units is located on the main electric control board of outdoor units , the position is referred to Fig

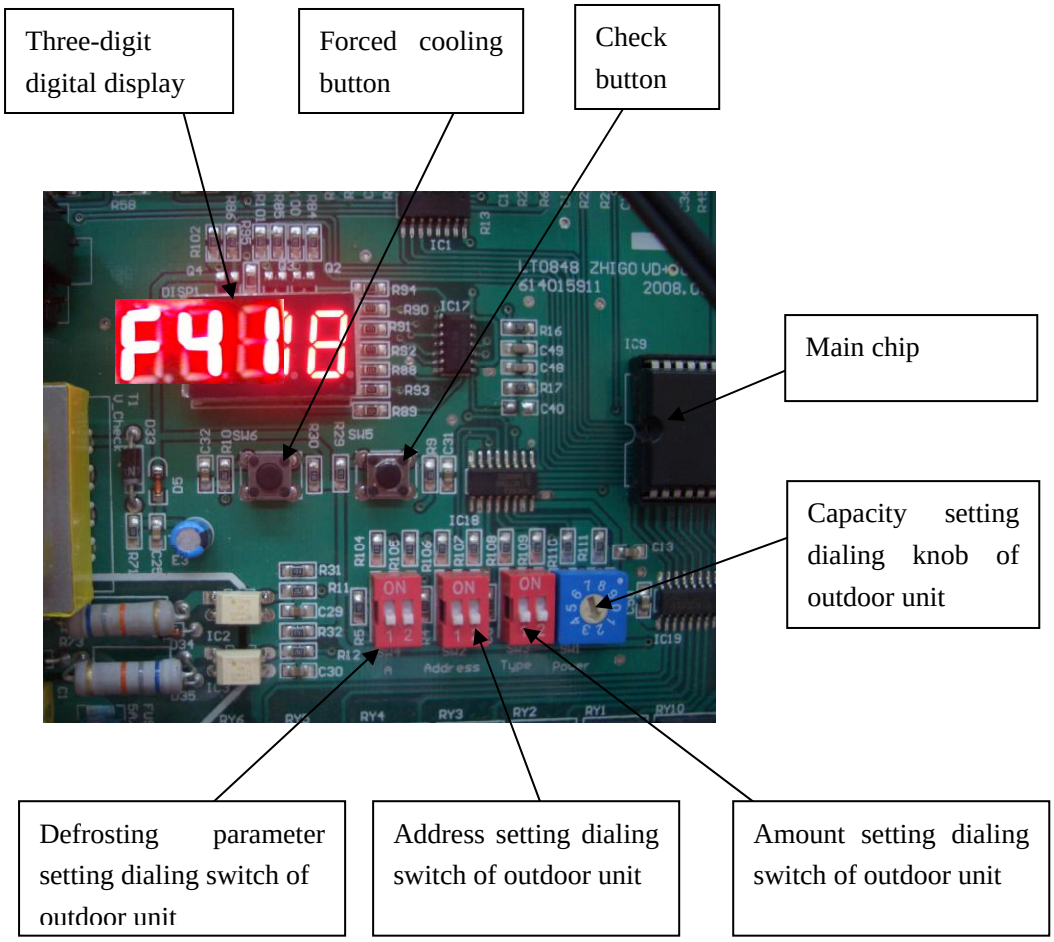
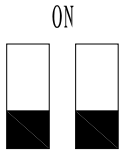
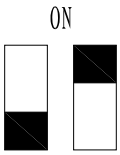
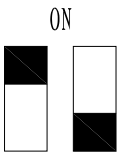
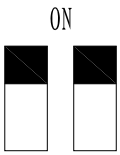

Three-digit digital display
Forced cooling button
Check button
Main chip
Capacity setting dialing knob of outdoor unit
Defrosting parameter setting dialing switch of outdoor unit
Address setting dialing switch of outdoor unit
Amount setting dialing switch of outdoor unit

Fig: Import parts position sketch map of outdoor units

Outdoor address dialing switch adopts the up/down dialing type dialing switch with two numbers. 0 means the dialing switch at the position below and 1 means the dialing switch at the upper position; Combining 0 and 1 can make four states, the detail can refer to the following table:

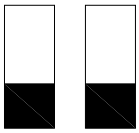
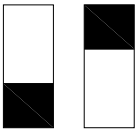
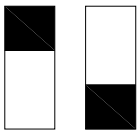
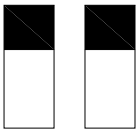
Table: Outdoor address dialing position

Dialing position diagramatic sketch				
Number	00	01	10	11
Meaning	Outdoor main machine	1# Outdoor secondary machine	2# Outdoor secondary machine	Wrong dialing code (it is not allowed.)
Instruction	Setting method of outdoor address dialing codes: 00 means that the outdoor unit is regareded as the main machine; 01 and 02 mean that the outdoor unit is separately regarded as 10 secondary machine and 2# secondary machine; 11 stands for wrong dialing way and the default value before delivery is 00.			

3.2.2 Outdoor units number of modules setting

As for Super Direct Current Converting Module Unit, several outdoor units can run at the same time in parallel. However, the amount of those machines running in parallel should be set before running, otherwise, the system will break down. The electronic controller of each outdoor unit has an outdoor module amount switch (the position can refer to the following drawing), which adopts the up/down dialing switch with two numbers. 0 means the dialing switch at the position below and 1 means the dialing switch at the upper position; Combining 0 and 1 can make four states, the detail can refer to the following table:

Table: The dialing switch position of outdoor module amount

Dialing position diagramatic sketch				
Number	00	01	10	11
Meaning	One outdoor unit	Two outdoor units in parallel	Three outdoor units in parallel	Wrong dialing codes (it is not allowed.)
Instruction	Setting method of outdoor module amount dialing codes: 00 , 01 and 10 mean that the amount of outdoor modules is separately one, two and three; The dialing code of main machine is the same as the dialing code of secondary machines; 11 stands for wrong dialing way and the default value before delivery is 00.			

NOTE:

a. Please set module amount for each outdoor unit in the system. Otherwise, the system will go wrong.

b. The amount set of modules is just the amount of actual modules. Otherwise, the system will go wrong.

c. Please dial correct codes of outdoor module amount and outdoor address. Otherwise, the system will go wrong.

3.2.3 The connection of RS 485 Terminal Resistance:

The terminal resistance is used for getting rid of the signal reflection which will happen when the impedance is not continuous or not matched during communicating.

At the end of the cable. Install a terminal resistance with the same characteristic impedance as the cable to keep the impedance continuous. Since the signal is intercommunicated, it needs to install another terminal resistance with the same spec at the other end of the cable, that is, install one matched resistance at each end of the communication network.

As for Super DC Inverter Module Unit of our company, there are two communication networks:

a. The communication between all indoor units and outdoor main machines;
b. The communication among outdoor units;

During the project installation, it is nard to identify which is the origination or the terminal so that we join a 100Ω parallel resistance on the outdoor main board with the communication interface of the indoor unit and no need to install a matched resistance for the communication network between indoor units and outdoor main machines.

In the communication network among outdoor units, the communication interface of each outdoor main board locates a 100Ω terminal resistance, which is controlled by a short-film J5 located below the interface, refer to Fig. After installing the system, the main machine is connected with J5(it is set before delivery) and the secondary machines are disconnected with J5.

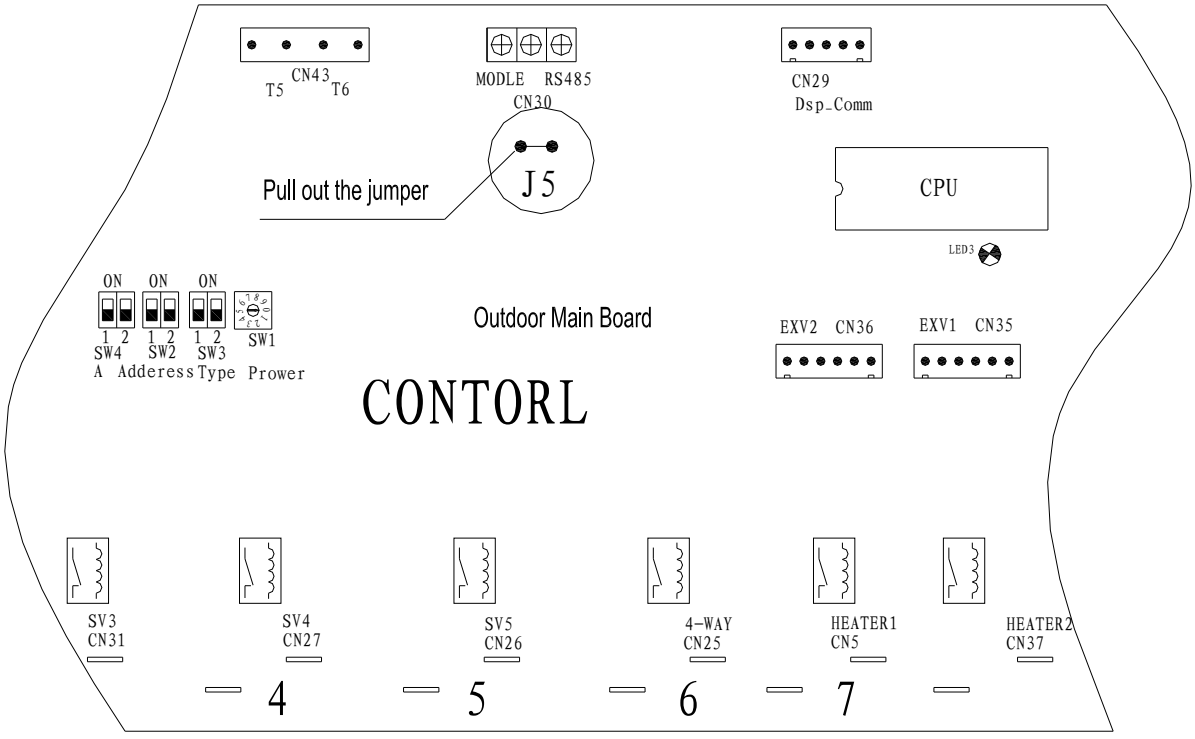


Fig: J5 jumper position sketch map

NOTE: It is no need to pull out J5 jumper of the main machine. As for J5 jumper of secondary machines, pull out them and then insert them into one jumper for next using.

Part 6
Troubleshooting

1. Faults display.....92

2. Troubleshooting.....99

2.1. Outdoor unit 99

2.2. Indoor unit.....118

1. Faults display

Number	Codes	Faults
Protection codes and Faults codes of Inverter compressor		
1	E01	Inverter module goes wrong (fault).
2	P01	The A.C input of Inverter compressor is so large that the compressor breaks down.
5	P02	The exhaust temperature of Inverter compressor is too high.
6	P03	The exhaust temperature sensor of Inverter compressor is wrong.
7	E02	The D.C generatrix sampling voltage of outdoor unit is abnormal (fault).
8	E03	Communication between outdoor main CMOS chip and Inverter driven CMOS chip goes wrong.
System Protection codes an d Faults codes		
9	P04	The high pressure (exhaust pressure) switch breaks.
10	P05	The low pressure (suction pressure) switch breaks.
11	P06	Protection for the system exhaust pressure is too high.
12	P07	Protection for the system suction pressure is too low.
13	P08	At capacity reduced protection state for too low suction pressure.
14	P09	At capacity reduced protection state for too high exhaust pressure.
15	P10	At capacity reduced protection state for too high exhaust temperature.
16	P11	The exhaust pressure sensor goes wrong.
17	P12	The suction pressure sensor goes wrong.
18	E04	Lack of Freon or the reversing valve goes wrong.
19	P13	The condensing temperature is too high in cooling mode.
20	P14	The condenser temperature sensor is wrong.
21	P15	The outdoor ambient temperature sensor is wrong.
22	P16	At protection state for too low voltage of A.C.
23	E05	The three-phase A.C power is lack of phase or the phase sequence is wrong.
24	P17	The communicating circuitry among outdoor units goes wrong.
25	E06	The addresses of outdoor units clash.
26	E07	The addresses of outdoor units are wrong.
27	E08	The communication among the main machine and all indoor units go wrong.

28	E09	Module capacity dial code goes wrong.
29	E10	Module amount dial code goes wrong.
30	E11	The fault for the module amount is reduced.
31	E12	The fault for the module amount is increased.
32	E13	The driven of module condensing fan goes wrong.
33	E14	The compressor operating is not kept in balance
Protection codes and Faults codes of Fixed-frequency compressor		
34	P18	The current input of #1 Fixed-frequency compressor is so large that the compressor breaks down.
35	P19	The exhaust temperature of #1 Fixed-frequency compressor is too high.
36	P20	The exhaust temperature sensor of #1 Fixed-frequency compressor is wrong.
37	P21	The current input of #2 Fixed-frequency compressor is so large that the compressor breaks down.
38	P22	The exhaust temperature of #2 Fixed-frequency compressor is too high.
39	P23	The exhaust temperature sensor of #2 Fixed-frequency compressor is wrong.
40	P24	Protection for the ambient temperature of the outdoor unit too low.

DC Inverter Module Unit adopts intelligent control, which can detect every parameter and the working condition of each functional part and once functional parts go wrong, the system will give the clue to user to deal with the fault in time in several ways and carry on some protection actions itself.

When the unit goes wrong, there are several ways to warn of user:

a. Three-bit digital display tube on the outdoor main electric control board indicates faults and protections with special characters;

b. Indicating lamps on the lamp board of indoor units flash in special order;

c. The operation panel of indoor units indicates faults and protections with special characters;

Now we will introduce them separately:

A. Three-bit digital display tube on the outdoor main electric control board indicates faults and protections with special characters:

The drawing of outdoor digital display tube is as follows:

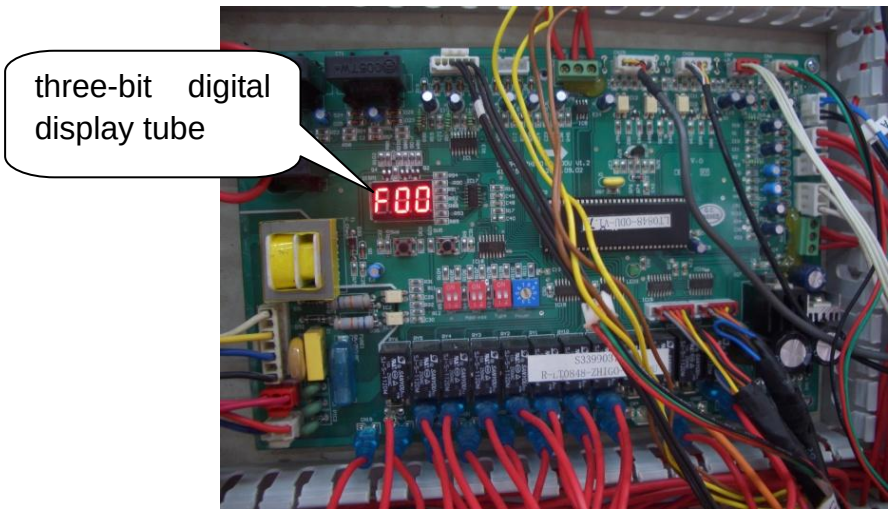


Fig 1: The drawing of outdoor digital display tube

When the system goes wrong or enters to the protection state, three-bit digital display tube on the outdoor main electric control board indicates faults and protections with special characters and the table below will list all codes and their meanings:

Table 1: Outdoor protection codes and fault codes table

NOTE: For a normal case, the three-bit digital display tube will indicate the amount of indoor units connected to the system before operating and the code display begins with “h” letter, for example, “h05” means that there are 5 sets of indoor units connected to the system. When the compressor begins to run, however, the three-bit digital display tube will indicate the current operating frequency of the inverter compressor and the code display begins with “F” letter, for example, “F62” means that the current operating frequency of the inverter compressor is 62Hz. Once the system goes wrong, the three-bit digital display tube will indicate the protection code or fault code and the code display begins with” E” or “P” letter; If there are several protections or faults, it will indicate those codes circularly and if the system are operating, the current operating frequency will be indicated.

B. Indicating lamps on the lamp board of indoor units flash in special order (especially for ceiling cassette type indoor unit):

The conventional diagram of the lamp board is as follows:

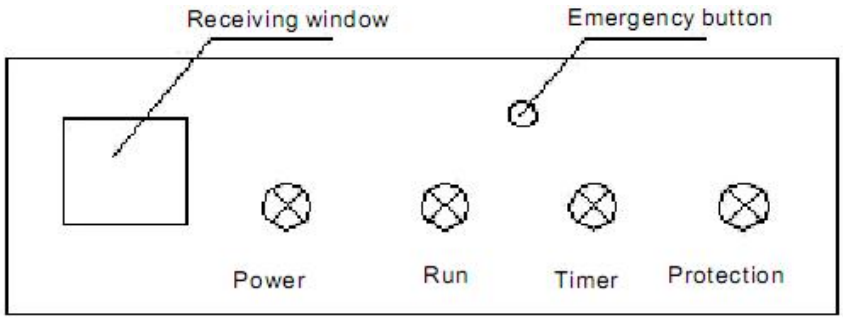


Fig 2: The conventional diagram of the lamp board

Indicating lamps on the lamp board:

It includes: Power lamp, run lamp, timer lamp, protection lamp, receiving window and emergency button. The details are as follows:

(1) Power lamp: Red, it will lighten when the air conditioner is supplied with the power;

(2) Run lamp: Green, it will lighten when the air conditioner runs and be off when the air conditioner stops;

(3) Timer lamp: Yellow, it will lighten when the air conditioner enters to the timing state;

(4) Protection lamp: Red, it will lighten when the air conditioner enters to the protection state;

(5) Emergency button: It will display the power of indoor unit in horsepower.

As for DC Inverter VRF system, if the system goes wrong or enters to the protection state during operating, indicating lamps on the lamp board of indoor units flash in special order and the table below will list flashing ways and their meanings:

Table 2: Indicating codes table of the indoor lamp board

Operating information	Light emitting diode codes	Instruction
“Defrost” cue	Flash once	It just displays at starting up and the run lamp flashes.
“Anti-cold air” cue	Flash twice	It just displays at starting up and the run lamp flashes.
“Non-priority” cue	Flash three times	It just displays at shutting down and the run lamp flashes.
“Outdoor units with fault” cue	Flash four times	It is kept displaying and the run lamp flashes.
Faults information	Light emitting diode codes	Instruction
Communication fault among the indoor unit and outdor units	Flash once	It just displays at shutting down, the protection lampe is kept lightening and the run lamp flashes.
Room temperature sensor fault	Flash twice	It just displays at shutting down, the protection lampe is kept lightening and the run lamp flashes.
The temperature sensor fault at the middle point of the pipe (T2)	Flash three times	It just displays at shutting down, the protection lampe is kept lightening and the run lamp flashes.
Outdoor units fault	Flash four times	It just displays at shutting down, the protection lampe is kept lightening and the run lamp flashes.
Indoor evaporator frosts for protection.	Flash five times	It just displays at shutting down, the protection lampe is kept lightening and the run lamp flashes.
The temperature sensor fault at outlet of the pipe (T2B)	Flash six times	It just displays at shutting down, the protection lampe is kept lightening and the run lamp flashes.
Indoor fan fault(as for PG motor)	Flash seven times	It just displays at shutting down, the protection lampe is kept lightening and the run lamp flashes.
Protection from the temperature at the middle point of the pipe too high in heating mode	Flash eight times	It just displays at shutting down, the protection lampe is kept lightening and the run lamp flashes.
Water pump fault	Flash nine times	It just displays at shutting down, the protection lampe is kept lightening and the run lamp flashes.

Remark 1: Flashing ways above are: It keeps flash for one second every other second lashes N times continually with 5 seconds idle.

Remark 2: “Outdoor units with fault” cue means that outdoor units are operating with the fault, that is, when the outdoor sensor goes wrong or the module is shielded, outdoor units are kept operating; However, “ Outdoor unit fault” means that outdoor units go wrong and the system is shut down. Besides, the indoor unit will not display the corresponding code when outdoor units enter to the protection state.

C. The wired controller of door units indicates faults and protections with special characters (especially for duct type and floor & ceiling type indoor unit):

When the system goes wrong or enters to the protection state or other operating states, LCD of the wired controller will display the corresponding code and give an alarm and the code display table is as follows:

Table 3: Code display Table

Operating information	Digital display tube codes	Instruction
"Defrost" cue	dEF(Pay attention to capital or small letter)	It just displays at starting up.
Fault information	Digital display tube codes	Instruction
Communication fault between the indoor unit and outdor units	E0	It just displays at shutting down.
Communication fault between the wire controller and indoor units	E1	It just displays at shutting down.
Room temperature sensor fault	E2	It just displays at shutting down.
The temperature sensor fault at the middle point of the pipe(T2)	E3	It just displays at shutting down.
Indoor evaporator frosts for protection	E4	It just displays at shutting down(no display).
The temperature sensor fault at outlet of the pipe (T2B)	E5	It just displays at shutting down.
Indoor fan fault(as for PG motor)	E6	It just displays at shutting down.
Water pump fault	E7	It just displays at shutting down.
Protection from the temperature at the middle point of the pipe T2 too high in heating mode	E8	It just displays at shutting down(no display).
Outdoor units fault	E9	It just displays at shutting down.

D. The operation panel of indoor units indicates faults and protections with special characters (especially for wall-mounted unit):

When the system goes wrong or enters to the protection state or other operating states, LED of the display will shows the corresponding code and give an alarm and the code display table is as follows:

Operation information	LED codes	Instruction
“Defrost” cue	Flash once	The running lamp flashing when start
“Anti cold air” cue	Flash twice	The running lamp flashing when start
“Non-priority” cue	Flash three times	The running lamp flashing and the unit is shut down.
“Outdoor units with fault” cue	Flash four times	The running lamp flashing all the time
Fault information	LED codes	Instruction
Communication fault with outdoor unit	E0	It just displays at shutting down.
Room temp. sensor fault	E2	It just displays at shutting down.
The middle of indoor coil temp. sensor is fault (T2)	E3	It just displays at shutting down.
Indoor coil frosting protection	E4	It just displays at shutting down.
The outlet of indoor coil temp. sensor is fault (T2B)	E5	It just displays at shutting down.
Indoor fan motor fault (only when the motor is PG motor)	E6	It just displays at shutting down.
Water pump fault	E7	It just displays at shutting down.
Outdoor ambient temp.(T4) too low	E8	It just displays at shutting down.
Outdoor unit fault	E9	It just displays at shutting down.
Zero passage protection	EA	It just displays at shutting down.
EPROOM fault	EB	Power on 20s and display
High temp. protection of the middle of indoor coil (T2) in heating mode	EC	It just displays at shutting down.

2. Troubleshooting

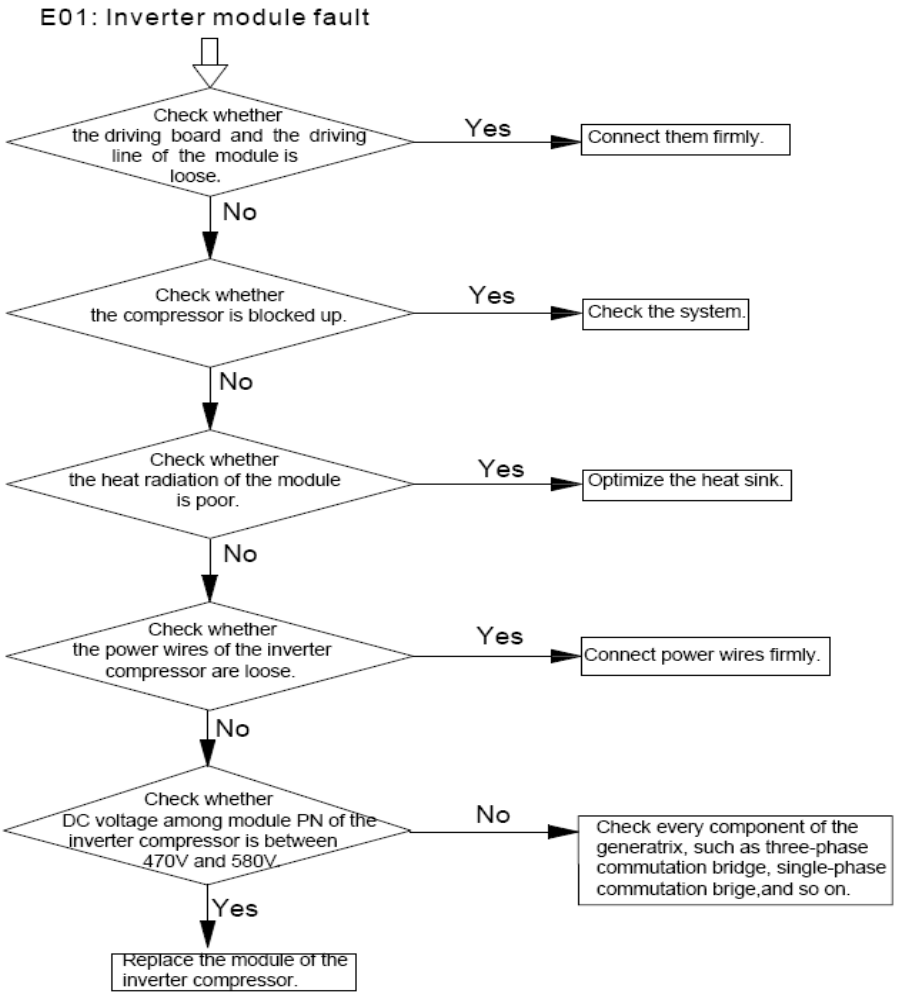
The followings will give an introduction for protection and faults codes separately and then explain how to deal with them.

2.1. Outdoor unit:

1) E01: Inverter module fault

Cause: During operating, when Inverter module goes wrong result from the external electromagnetism interruption or the poor power or the fault itself, E01 will be indicated on the outdoor electronic control board.

Troubleshooting: Please carry on maintaining following the flow below:


E01: Inverter module fault
Check whether the driving board and the driving line of the module is loose.
Yes
Connect them firmly.
No
Check whether the compressor is blocked up.
Yes
Check the system.
No
Check whether the heat radiation of the module is poor.
Yes
Optimize the heat sink.
No
Check whether the power wires of the inverter compressor are loose.
Yes
Connect power wires firmly.
No
Check whether DC voltage among module PN of the inverter compressor is between 470V and 580V.
No
Check every component of the generatrix, such as three-phase commutation bridge, single-phase commutation brige,and so on.
Yes
Replace the module of the inverter compressor.

2) E02: DC generatrix sampling voltage is abnormal

Causes:

When three-phase voltage input of outdoor units is too high or too low or when the three-phase power is lack of phase, it will cause DC generatrix sampling voltage abnormal and the system electric control will display E02.

Troubleshooting: please check the power.

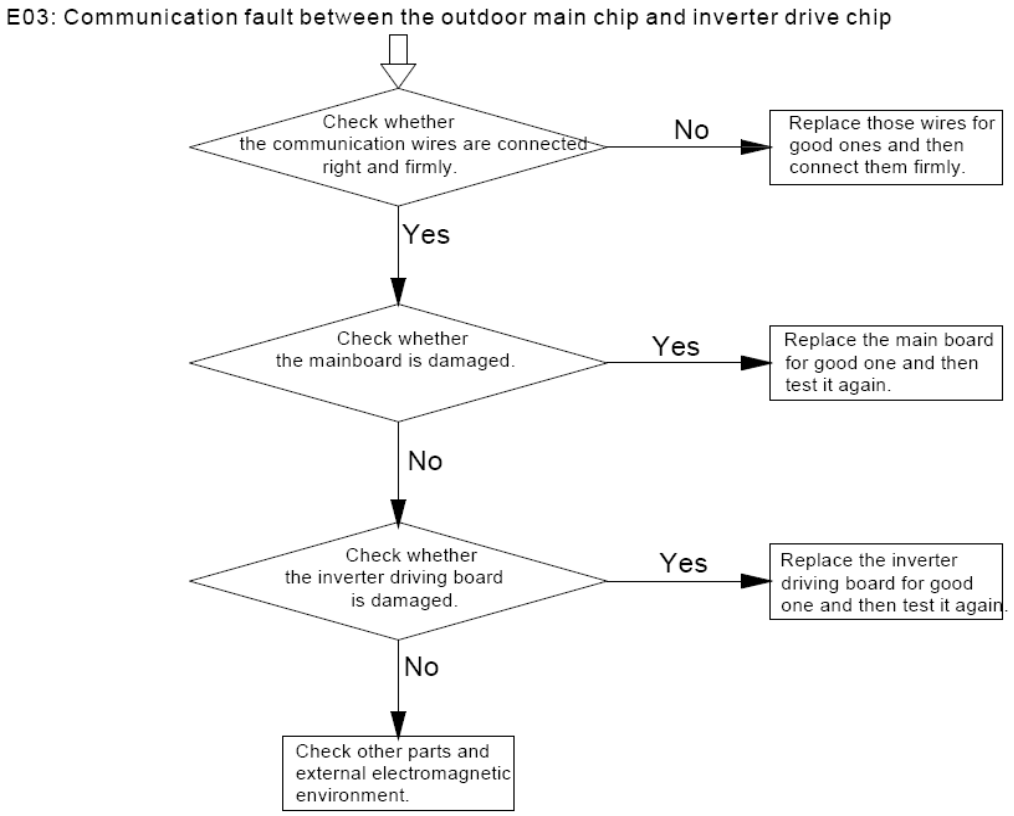
3) E03: Communication fault between the outdoor main chip and inverter drive chip

Causes:

The following factors cause the communication fault and the system electric control will display E03: such as, the electric control board faults, the driving board fault, the communication wire open circuit, strong electromagnetism interruption, and so on.

Troubleshooting:

Please carry on maintaining following the flow below:


E03: Communication fault between the outdoor main chip and inverter drive chip
Check whether the communication wires are connected right and firmly.
No
Replace those wires for good ones and then connect them firmly.
Yes
Check whether the mainboard is damaged.
Yes
Replace the main board for good one and then test it again.
No
Check whether the inverter driving board is damaged.
Yes
Replace the inverter driving board for good one and then test it again.
No
Check other parts and external electromagnetic environment.

4) E04: Lack of refrigerant

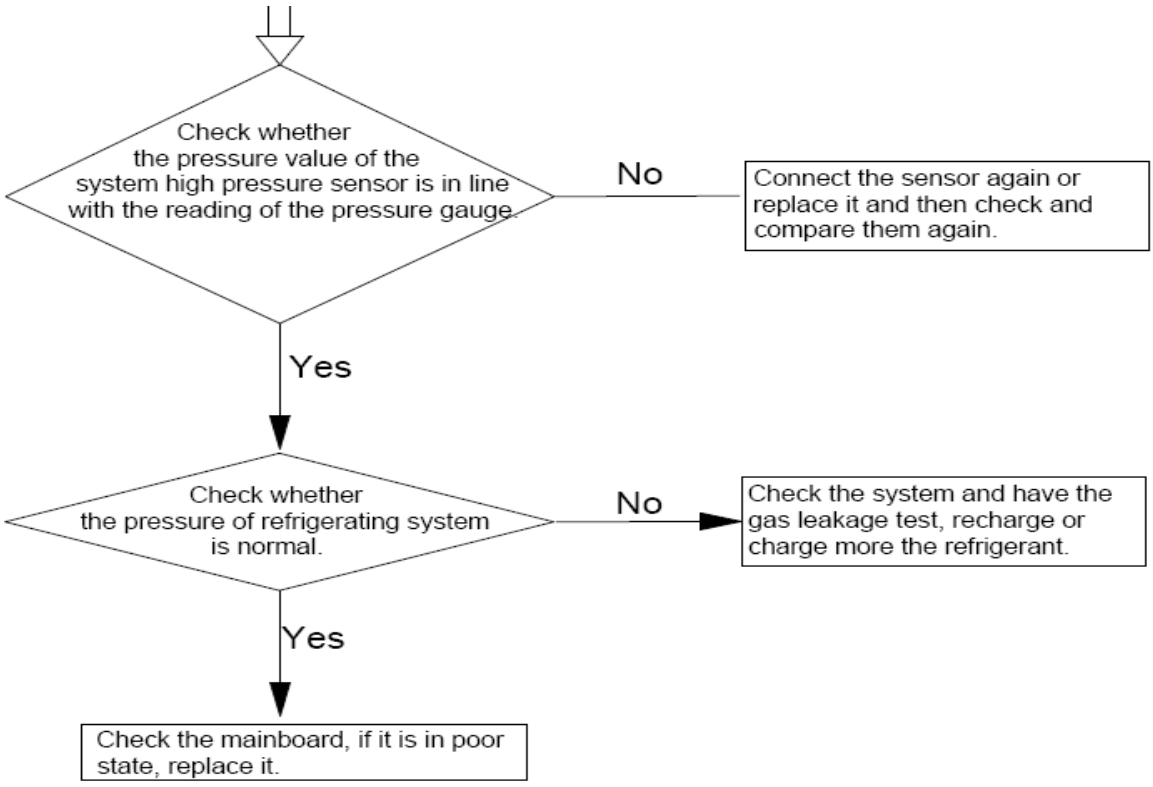
Causes:

When the high-pressure pressure is less than 0.35MPa for the system at off state or the system trips four times within 45 minutes for low pressure, the system electric control will display E04:

Troubleshooting:

Please carry on maintaining following the flow below:

E04: Lack of refrigerant


Check whether the pressure value of the system high pressure sensor is in line with the reading of the pressure gauge.
No
Connect the sensor again or replace it and then check and compare them again.
Yes
Check whether the pressure of refrigerating system is normal.
No
Check the system and have the gas leakage test, recharge or charge more the refrigerant.
Yes
Check the mainboard, if it is in poor state, replace it.

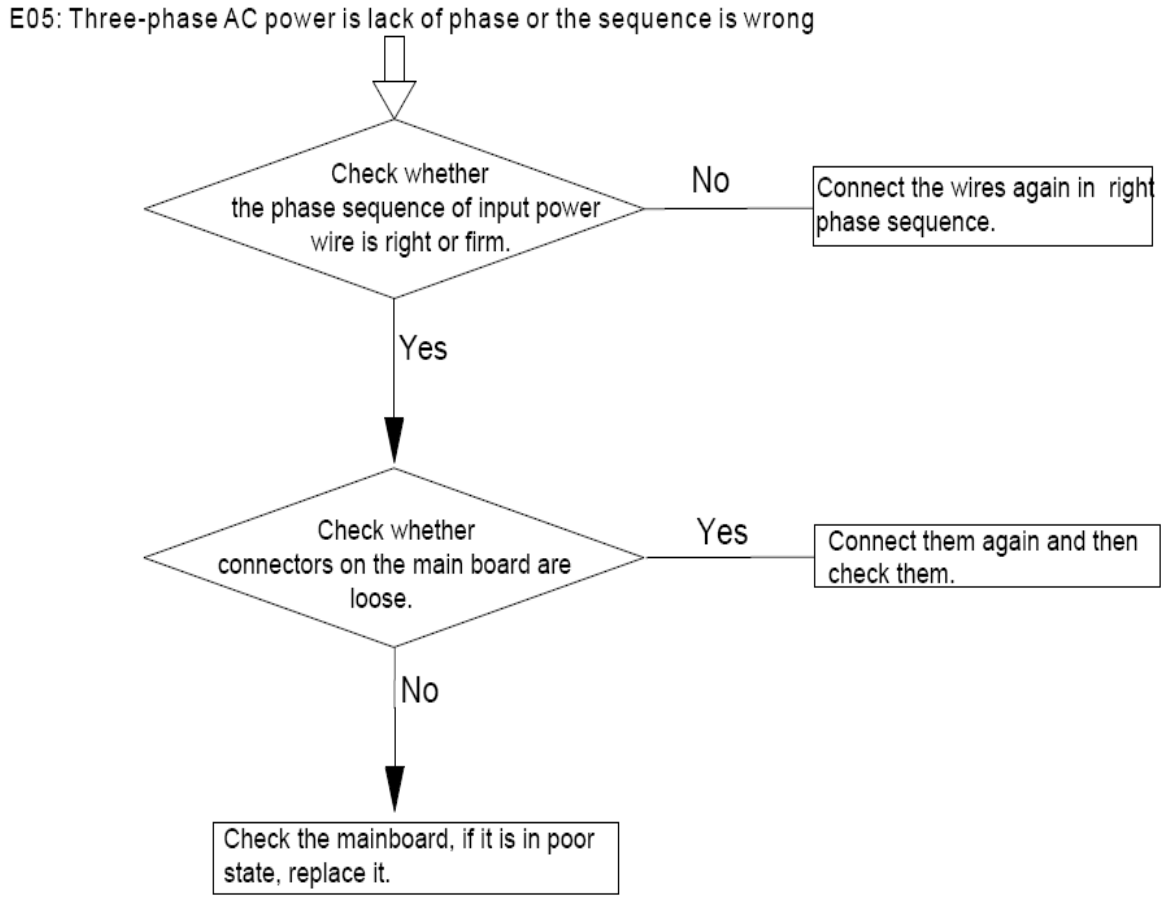
5) E05: Three-phase AC power is lack of phase or the sequence is wrong

Causes:

When three-phase AC power is lack of phase or the sequence is wrong, the system electric control will display E05:

Troubleshooting:

Please carry on maintaining following the flow below:


E05: Three-phase AC power is lack of phase or the sequence is wrong
Check whether the phase sequence of input power wire is right or firm.
No
Connect the wires again in right phase sequence.
Yes
Check whether connectors on the main board are loose.
Yes
Connect them again and then check them.
No
Check the mainboard, if it is in poor state, replace it.

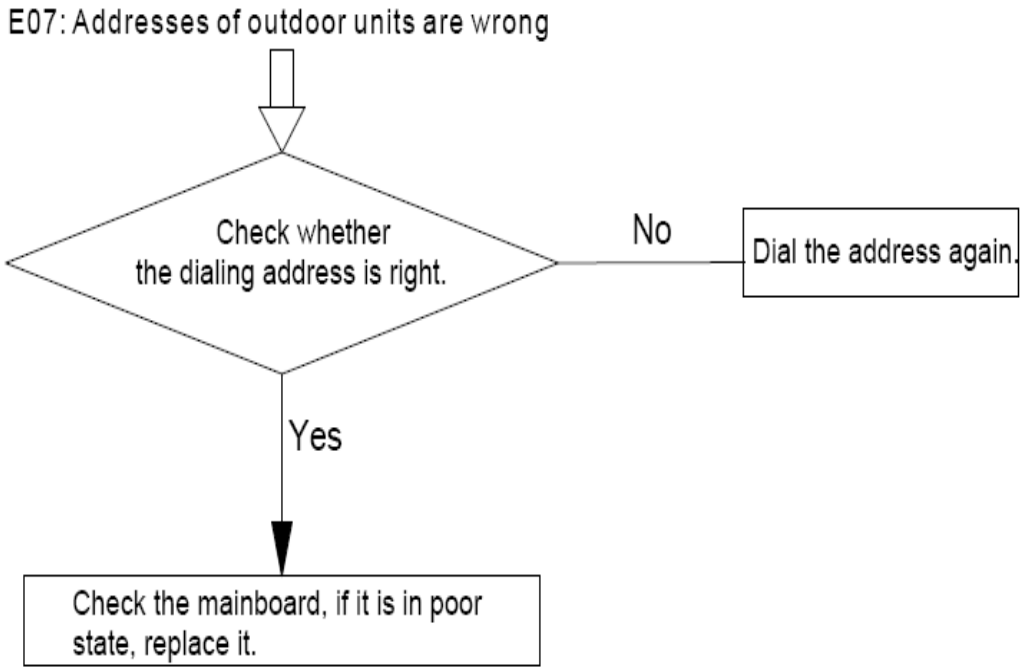
6) E07: Addresses of outdoor units are wrong

Causes:

When the address of outdoor unit is dialed to the wrong position, the system electric control will display E07:

Troubleshooting:

Please carry on maintaining following the flow below


E07: Addresses of outdoor units are wrong
Check whether the dialing address is right.
No
Dial the address again.
Yes
Check the mainboard, if it is in poor state, replace it.

NOTE: In System Installation section, it give a detailed instruction for how to dial the address.

Instruction for dialing outdoor address: The dialing address of main machine is 00 and that of #1 Secondary unit and #2 Secondary units are 01 and 10 separately, otherwise it means the dialing address is wrong and the system will display E07.

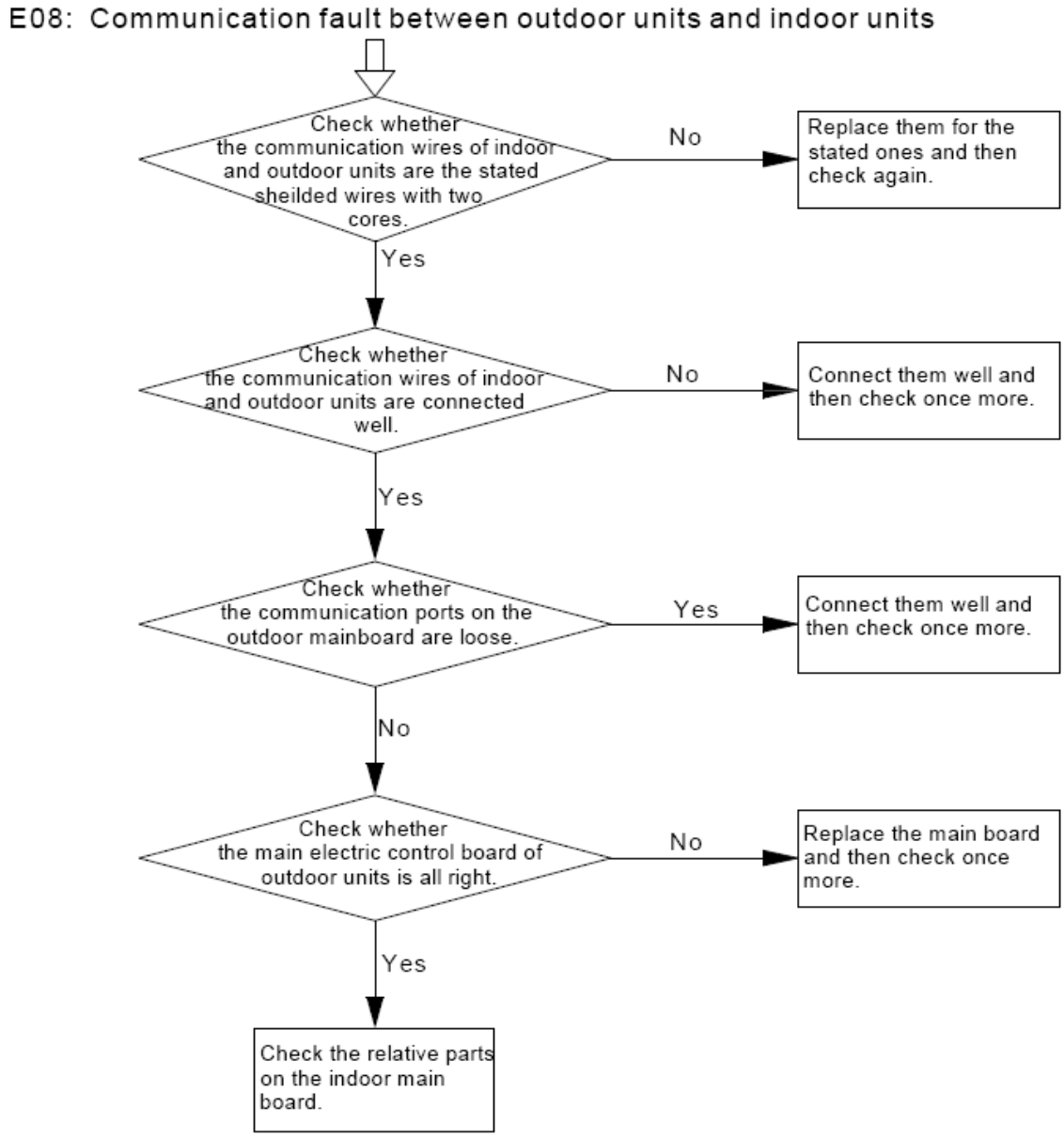
7) E08: Communication fault between outdoor units and indoor units

Causes:

When the communication wires between outdoor units and indoor units are connected wrong or some wires are not connected well, it will lead the communication between them go wrong and the system electric control will display E08:

Troubleshooting:

Please carry on maintaining following the flow below:


E08: Communication fault between outdoor units and indoor units
Check whether the communication wires of indoor and outdoor units are the stated sheilded wires with two cores.
No
Replace them for the stated ones and then check again.
Yes
Check whether the communication wires of indoor and outdoor units are connected well.
No
Connect them well and then check once more.
Yes
Check whether the communication ports on the outdoor mainboard are loose.
Yes
Connect them well and then check once more.
No
Check whether the main electric control board of outdoor units is all right.
No
Replace the main board and then check once more.
Yes
Check the relative parts on the indoor main board.

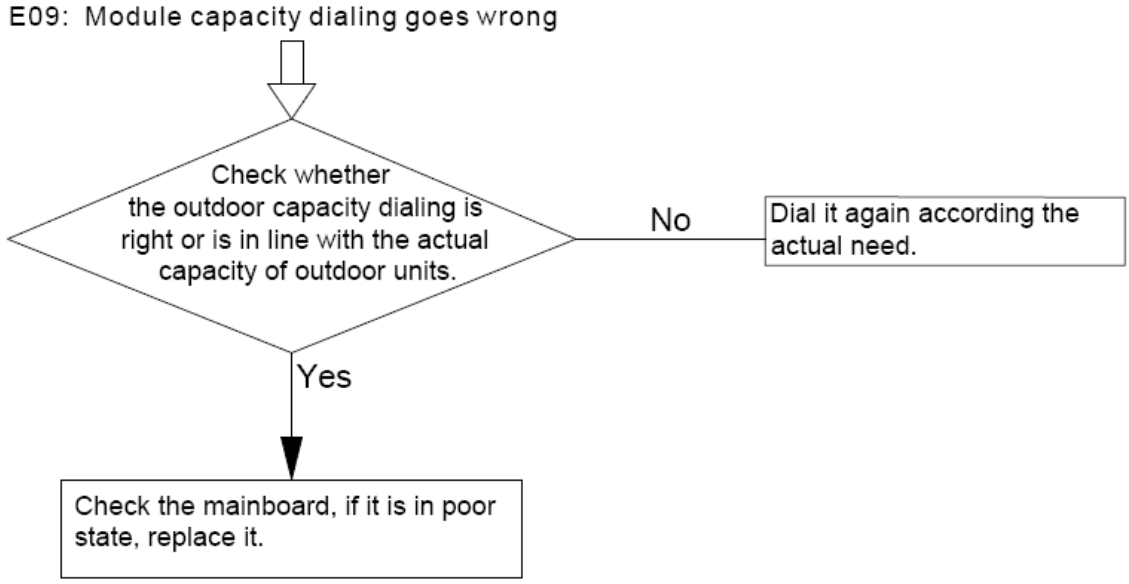
8) E09: Module capacity dialing goes wrong

Causes:

When module capacity dialing goes wrong and the system electric control will display E09. Besides, the capacity dialing has been set before delivery and it cannot be modified at will, otherwise it will cause a bad incident.

Troubleshooting:

When E09 is indicated on the outdoor electric control board, please consult with the salesmen or the technical department of our company and then carry on maintaining following the flow after affirming the fault:


E09: Module capacity dialing goes wrong
Check whether the outdoor capacity dialing is right or is in line with the actual capacity of outdoor units.
No
Dial it again according the actual need.
Yes
Check the mainboard, if it is in poor state, replace it.

9) E10: Module amount dialing goes wrong

E11: Module amount is reduced

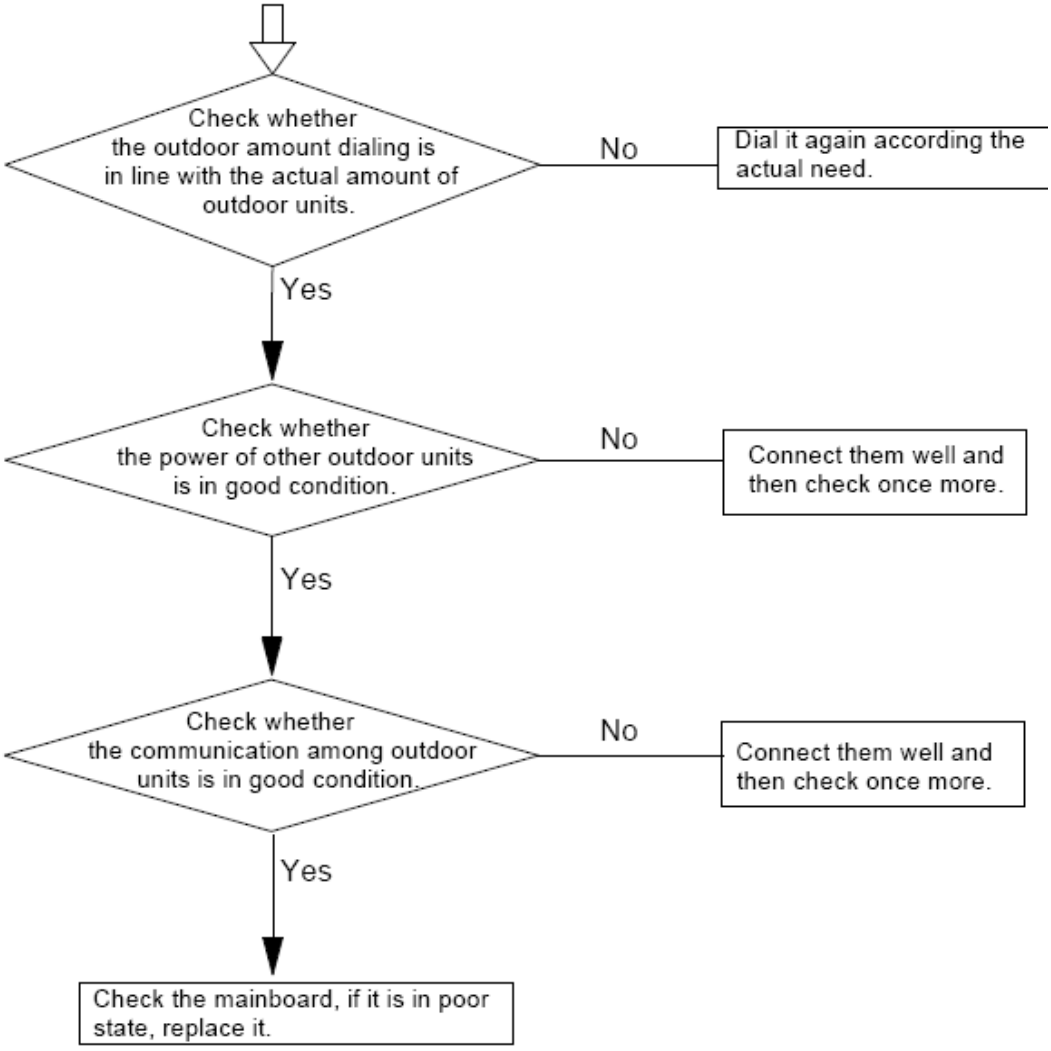
E12: Module amount is increased

Causes:

The main machine of DC Inverter Module Unit can automatically inspect the actual amount of operating outdoor units and the amount set of outdoor units so that when the former is not in line with the latter, the system electric control will display the corresponding fault codes:

Troubleshooting:

When E10, E11 or E12 is indicated on the outdoor electric control board, please carry on maintaining following the flow below:


Check whether the outdoor amount dialing is in line with the actual amount of outdoor units.
No
Dial it again according the actual need.
Yes
Check whether the power of other outdoor units is in good condition.
No
Connect them well and then check once more.
Yes
Check whether the communication among outdoor units is in good condition.
No
Connect them well and then check once more.
Yes
Check the mainboard, if it is in poor state, replace it.

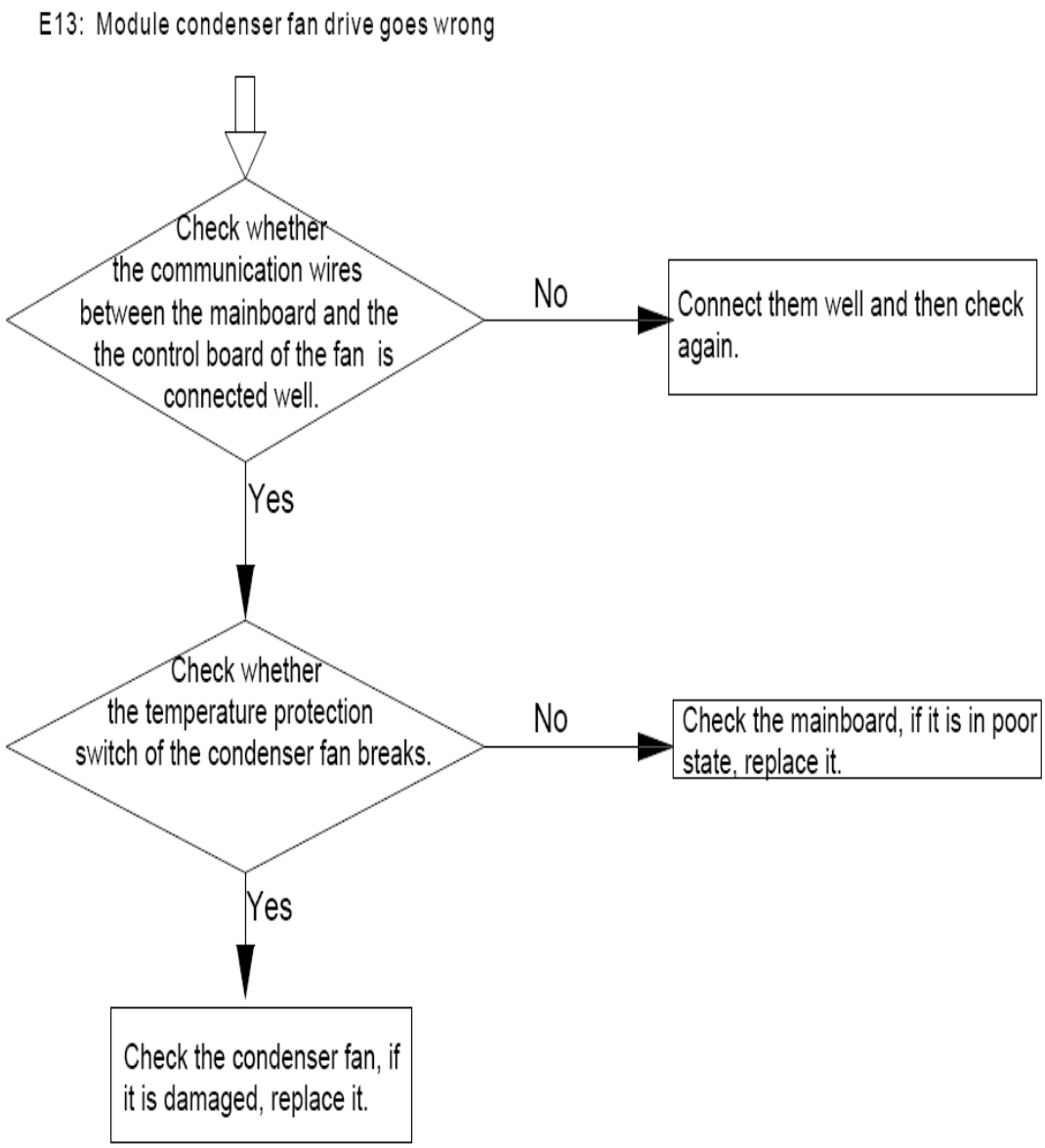
10) E13: Module condenser fan drive goes wrong

Causes:

Chigo DC Inverter VRF unit adopts AC inverter fan. When the fan goes wrong or the overheating protection switch of the fan breaks, the system electric control will display E13:

Troubleshooting:

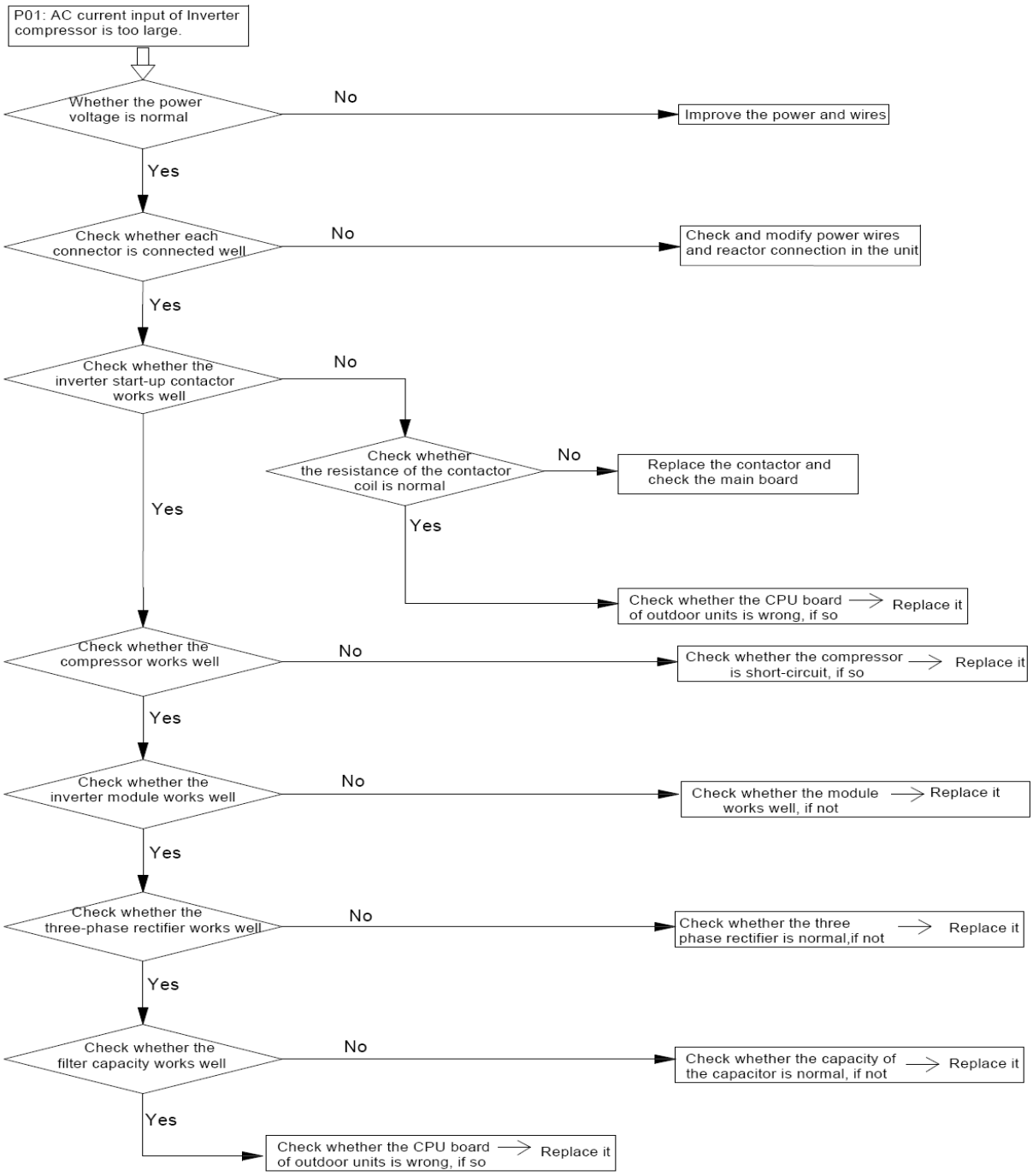
Please carry on maintaining following the flow below:


E13: Module condenser fan drive goes wrong
Check whether the communication wires between the mainboard and the the control board of the fan is connected well.
No
Connect them well and then check again.
Yes
Check whether the temperature protection switch of the condenser fan breaks.
No
Check the mainboard, if it is in poor state, replace it.
Yes
Check the condenser fan, if it is damaged, replace it.

11) P01: AC current input of Inverter compressor is so large that the compressor breaks down

Causes: When AC current input of Inverter compressor is more than 16A result from the large loads or other factors, the system electric control will display P1 and stop the compressor:

Troubleshooting: Please carry on maintaining following the flow below:


P01: AC current input of Inverter compressor is too large.
Whether the power voltage is normal
No
Improve the power and wires
Yes
Check whether each connector is connected well
No
Check and modify power wires and reactor connection in the unit
Yes
Check whether the inverter start-up contactor works well
No
Check whether the resistance of the contactor coil is normal
No
Replace the contactor and check the main board
Yes
Yes
Check whether the CPU board of outdoor units is wrong, if so
Replace it
Check whether the compressor works well
No
Check whether the compressor is short-circuit, if so
Replace it
Yes
Check whether the inverter module works well
No
Check whether the module works well, if not
Replace it
Yes
Check whether the three-phase rectifier works well
No
Check whether the three phase rectifier is normal,if not
Replace it
Yes
Check whether the filter capacity works well
No
Check whether the capacity of the capacitor is normal, if not
Replace it
Yes
Check whether the CPU board of outdoor units is wrong, if so
Replace it

12) P02: The exhaust temperature of Inverter compressor is too high

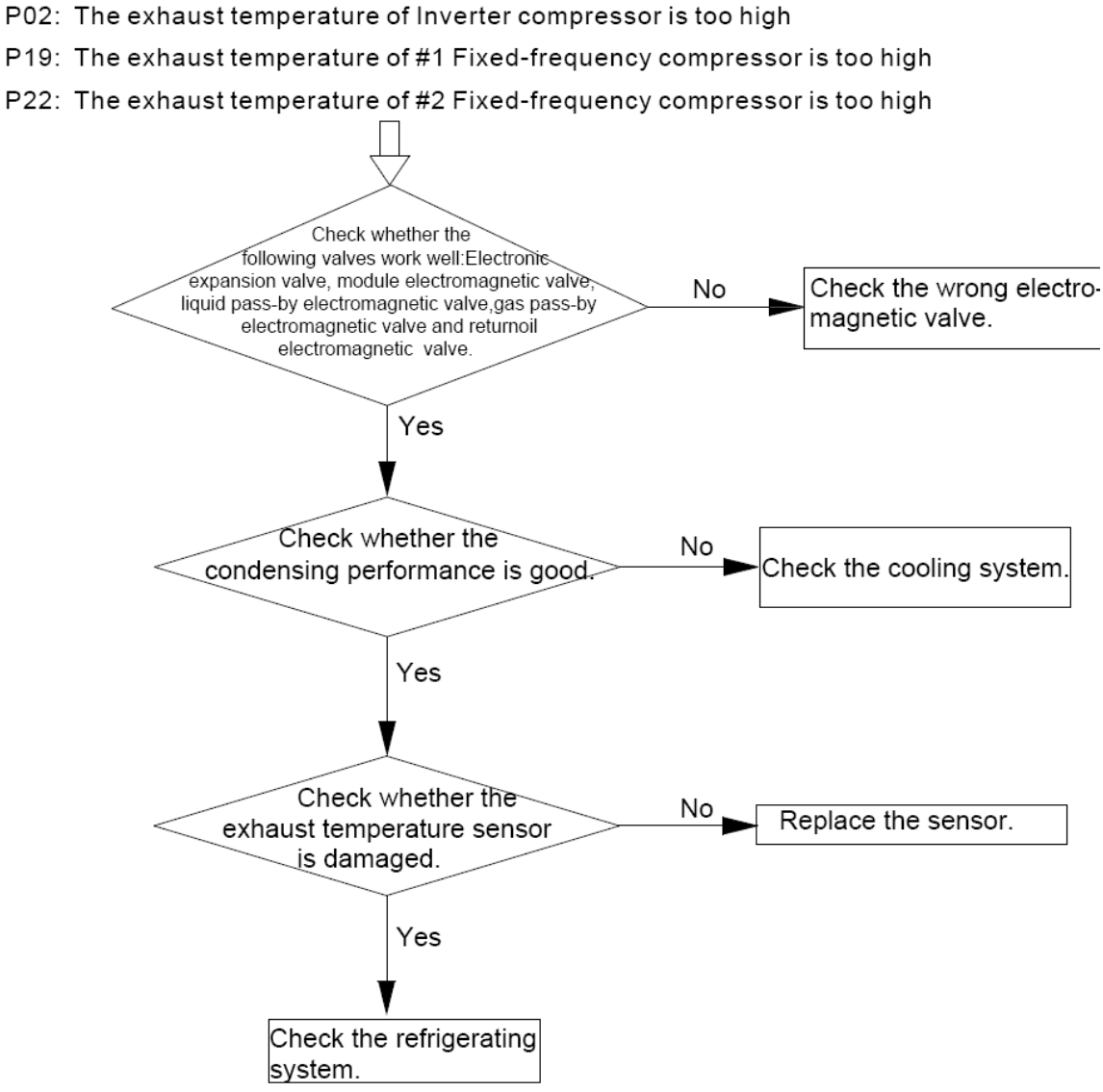
P19: The exhaust temperature of #1 Fixed-frequency compressor is too high

P22: The exhaust temperature of #2 Fixed-frequency compressor is too high

Causes: When the exhaust temperature of Inverter compressor gets to 120 during operating, the system will clue to the compressor entering to the protection from the exhaust temperature too high and the system electric control will display the corresponding protection code:

Troubleshooting:

When the compressor enters to the protection from the exhaust temperature too high, please carry on maintaining following the flow below:


P02: The exhaust temperature of Inverter compressor is too high
P19: The exhaust temperature of #1 Fixed-frequency compressor is too high
P22: The exhaust temperature of #2 Fixed-frequency compressor is too high
Check whether the following valves work well:Electronic expansion valve, module electromagnetic valve, liquid pass-by electromagnetic valve,gas pass-by electromagnetic valve and returnoil electromagnetic valve.
No
Check the wrong electro-magnetic valve.
Yes
Check whether the condensing performance is good.
No
Check the cooling system.
Yes
Check whether the exhaust temperature sensor is damaged.
No
Replace the sensor.
Yes
Check the refrigerating system.

13) P03: The exhaust temperature sensor of Inverter compressor goes wrong

P14: The condensing temperature sensor goes wrong

P15: The sensor of outdoor ambient temperature goes wrong

P20: The exhaust temperature of #1 Fixed-frequency compressor goes wrong

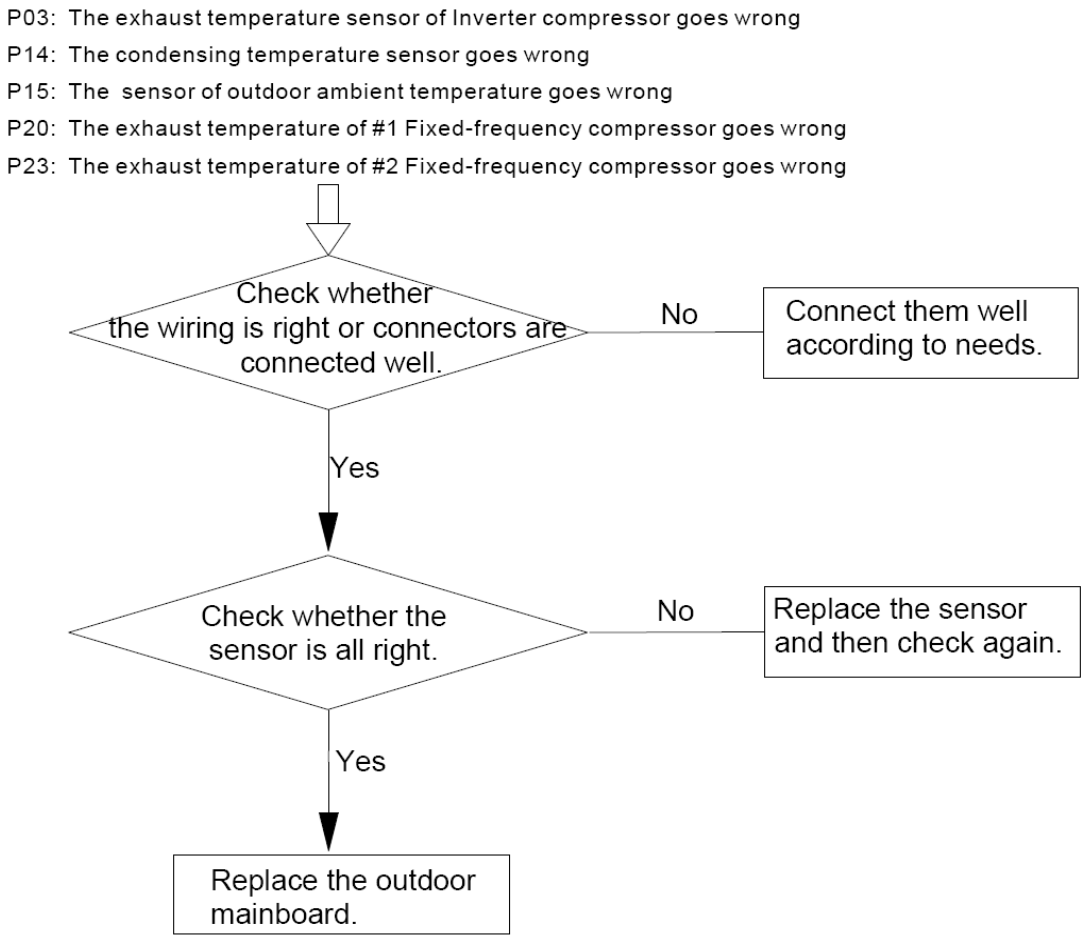
P23: The exhaust temperature of #2 Fixed-frequency compressor goes wrong

Causes:

When the temperature sensor or the main board goes wrong, the outdoor system will clue to the corresponding temperature sensor fault.

Troubleshooting:

Please carry on the flow below:


P03: The exhaust temperature sensor of Inverter compressor goes wrong
P14: The condensing temperature sensor goes wrong
P15: The sensor of outdoor ambient temperature goes wrong
P20: The exhaust temperature of #1 Fixed-frequency compressor goes wrong
P23: The exhaust temperature of #2 Fixed-frequency compressor goes wrong
Check whether the wiring is right or connectors are connected well.
No
Connect them well according to needs.
Yes
Check whether the sensor is all right.
No
Replace the sensor and then check again.
Yes
Replace the outdoor mainboard.

14) P04: High-pressure switch (exhaust pressure switch) breaks

P05: Low-pressure switch (suction pressure switch) breaks

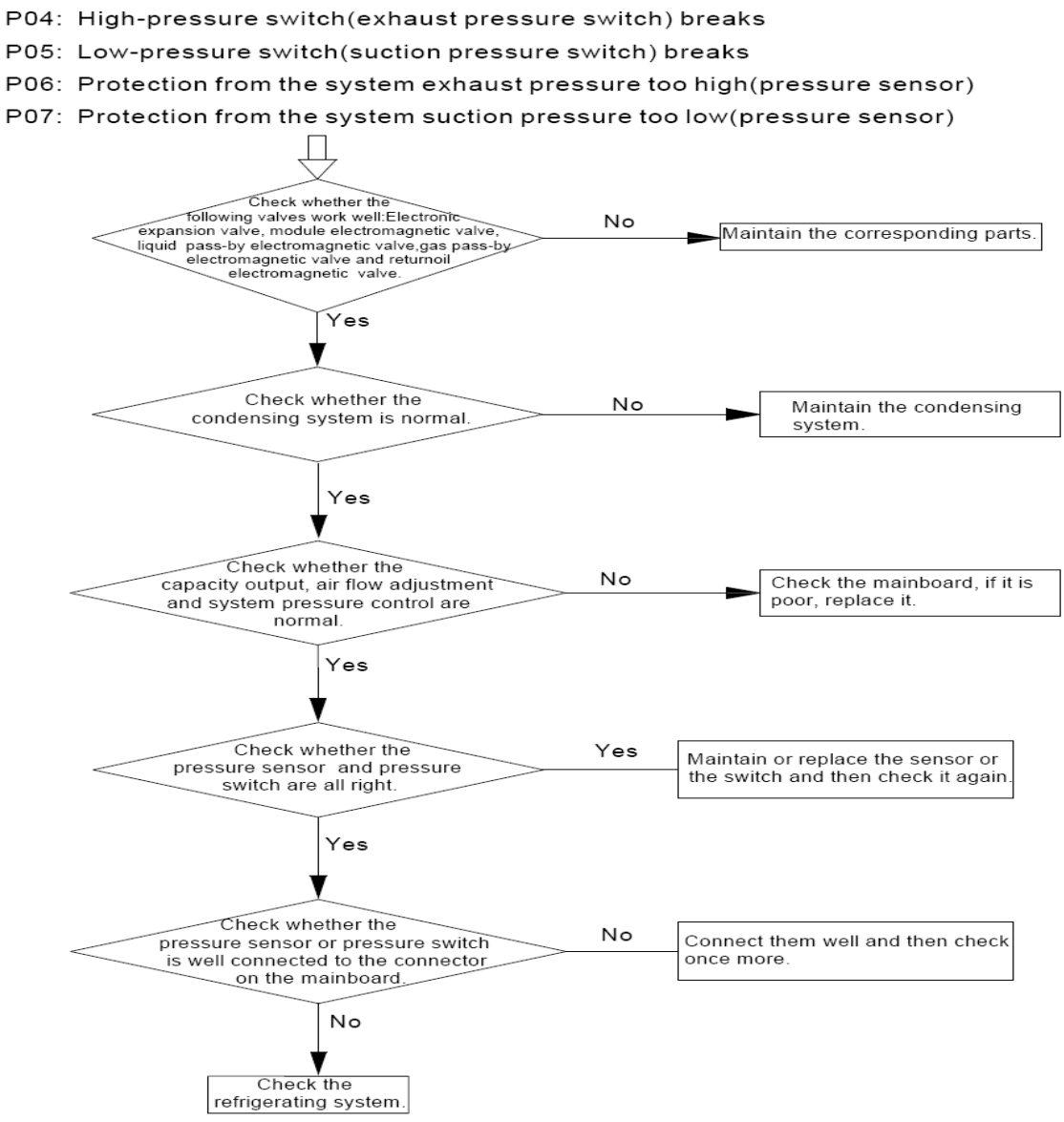
P06: Protection from the system exhaust pressure too high (pressure sensor)

P07: Protection from the system suction pressure too low (pressure sensor)

Causes: When the system pressure is too high or too low, the pressure components go wrong or connectors on the electric control board are not contacted well, the system electric control will display the corresponding fault codes.

Troubleshooting:

When P04, P05, P06 or P07 is indicated on the outdoor electric control board, please carry on maintaining following the flow below:


P04: High-pressure switch(exhaust pressure switch) breaks
P05: Low-pressure switch(suction pressure switch) breaks
P06: Protection from the system exhaust pressure too high(pressure sensor)
P07: Protection from the system suction pressure too low(pressure sensor)
Check whether the following valves work well:Electronic expansion valve, module electromagnetic valve, liquid pass-by electromagnetic valve,gas pass-by electromagnetic valve and returnoil electromagnetic valve.
No
Maintain the corresponding parts.
Yes
Check whether the condensing system is normal.
No
Maintain the condensing system.
Yes
Check whether the capacity output, air flow adjustment and system pressure control are normal.
No
Check the mainboard, if it is poor, replace it.
Yes
Check whether the pressure sensor and pressure switch are all right.
Yes
Maintain or replace the sensor or the switch and then check it again.
Yes
Check whether the pressure sensor or pressure switch is well connected to the connector on the mainboard.
No
Connect them well and then check once more.
No
Check the refrigerating system.

15) P08: At capacity reduced protection state for too low suction pressure

P09: At capacity reduced protection state for too high exhaust pressure

P10: At capacity reduced protection state for too high exhaust temperature

DC Inverter VRF system can control and adjust the operation by itself to make sure the system running in the best state and avoid of the danger according to the ambient condition and use condition for user. When those codes are displayed, that means that the system is at adjustment state and if those faults cause the system out of work, please check whether the refrigerant system is normal.

16) P11: The exhaust pressure sensor goes wrong

P12: The suction pressure sensor goes wrong

Causes:

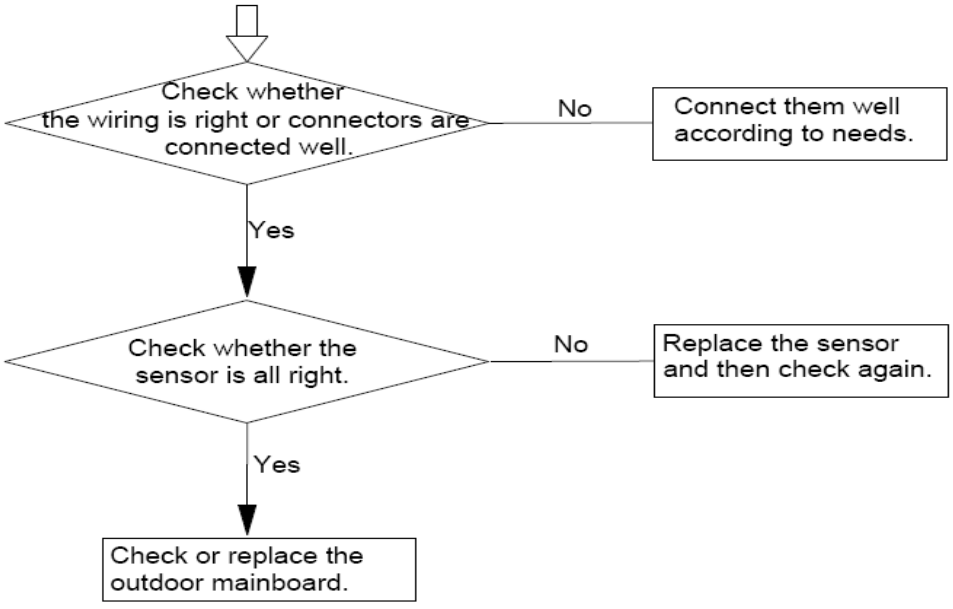
When the pressure sensor is damaged or connectors on the main board are loose, the system will clue to the corresponding pressure sensor fault.

Troubleshooting:

When the system clues to the corresponding pressure sensor fault, please carry on maintaining the sensor by following the flow below:

P11: The exhaust pressure sensor goes wrong

P12: The suction pressure sensor goes wrong


Check whether the wiring is right or connectors are connected well.
No
Connect them well according to needs.
Yes
Check whether the sensor is all right.
No
Replace the sensor and then check again.
Yes
Check or replace the outdoor mainboard.

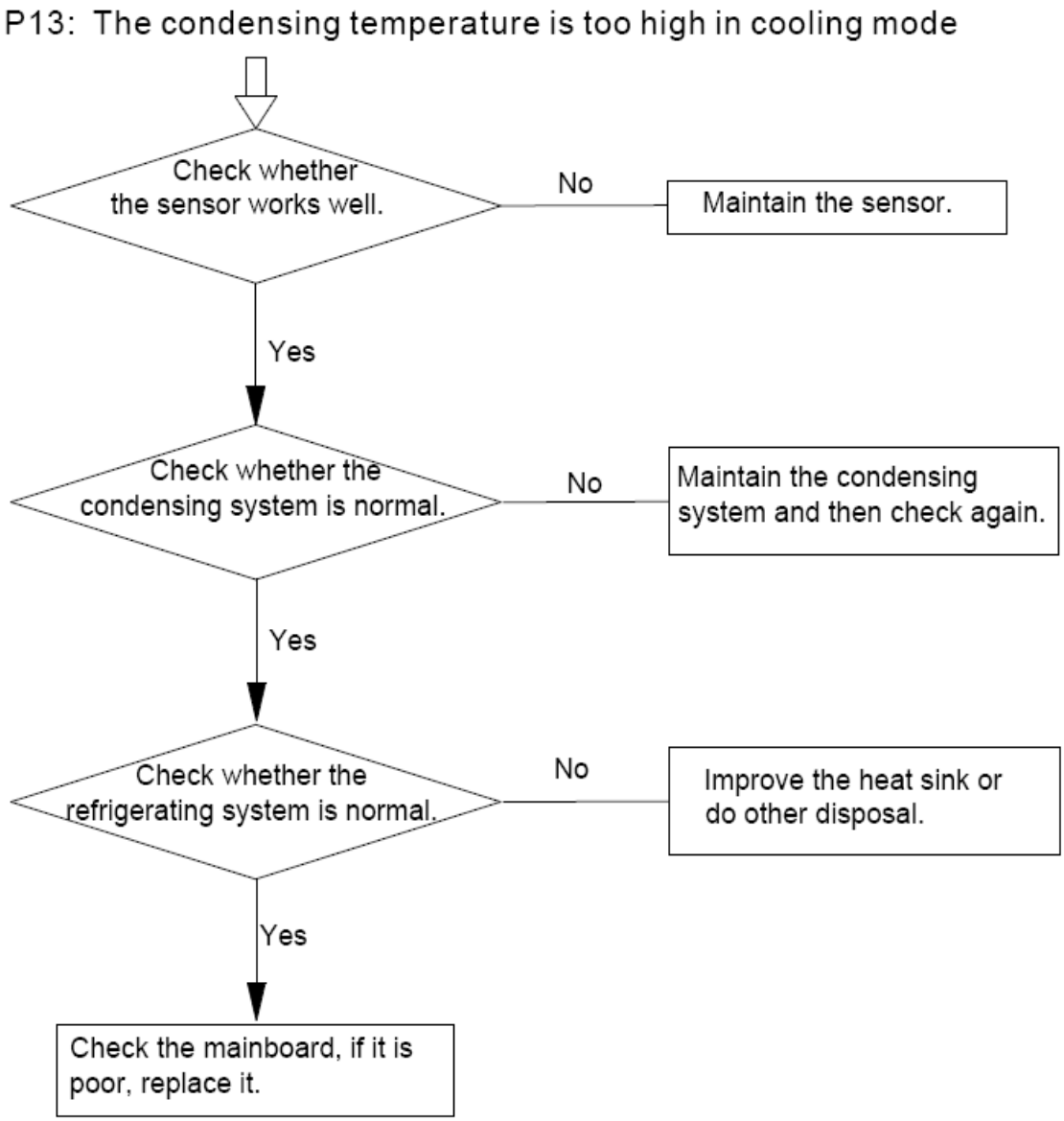
17) P13: The condensing temperature is too high in cooling mode

Causes:

When the condensing humidity surpasses 62℃, the system will clue to the condensing temperature too high.

Troubleshooting:

When the system displays P13, please carry on maintaining by following the flow below:


P13: The condensing temperature is too high in cooling mode
Check whether the sensor works well.
No
Maintain the sensor.
Yes
Check whether the condensing system is normal.
No
Maintain the condensing system and then check again.
Yes
Check whether the refrigerating system is normal.
No
Improve the heat sink or do other disposal.
Yes
Check the mainboard, if it is poor, replace it.

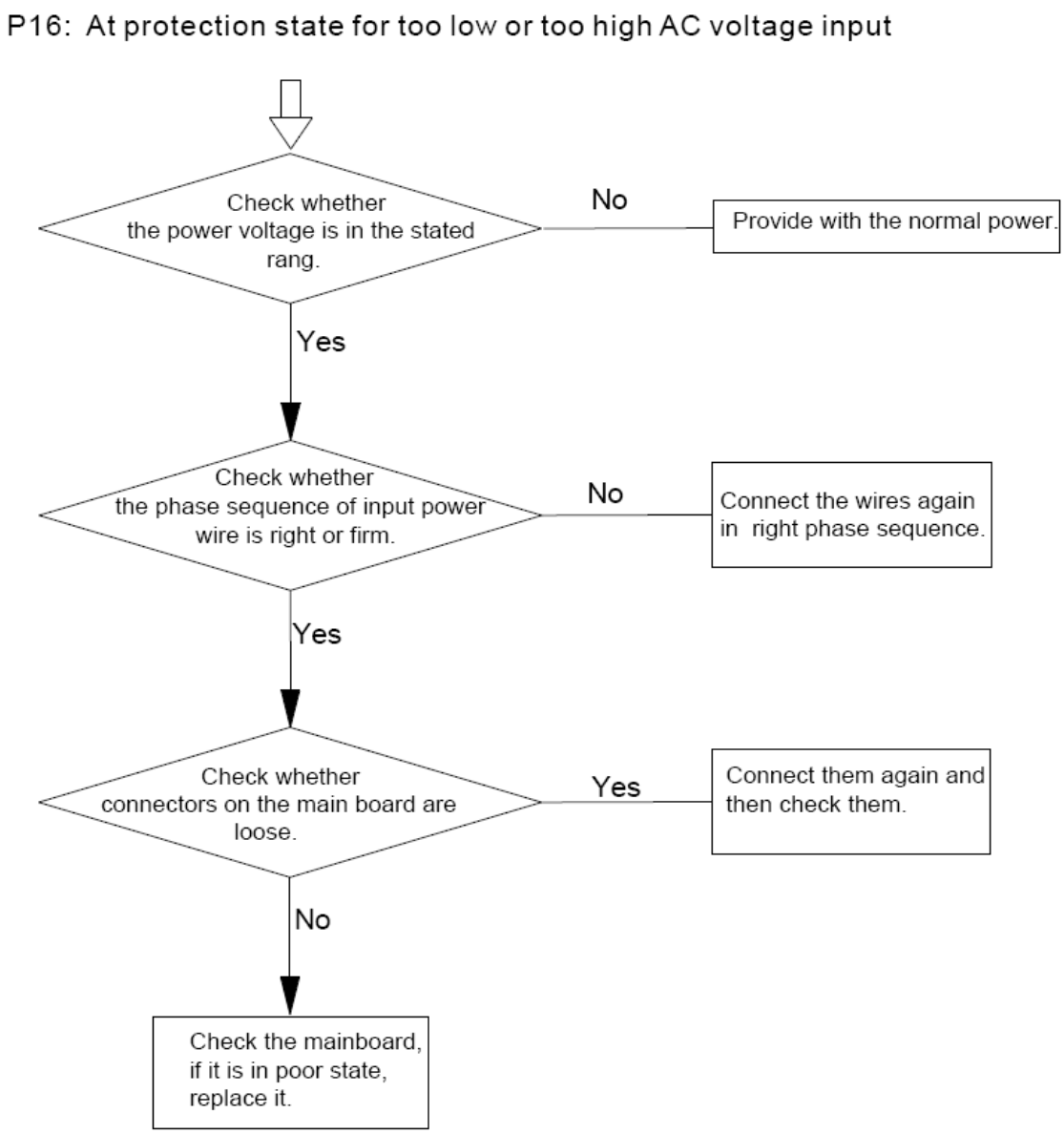
18) P16: At protection state for too low or too high AC voltage input

Causes:

When the external AC voltage input is lower than 190V or higher than 270V (the normal voltage is 220V), the system will clue to entering the protection state for too low or too high AC voltage input

Troubleshooting:

Please carry on maintaining by following the flow below:


P16: At protection state for too low or too high AC voltage input
Check whether the power voltage is in the stated rang.
No
Provide with the normal power.
Yes
Check whether the phase sequence of input power wire is right or firm.
No
Connect the wires again in right phase sequence.
Yes
Check whether connectors on the main board are loose.
Yes
Connect them again and then check them.
No
Check the mainboard, if it is in poor state, replace it.

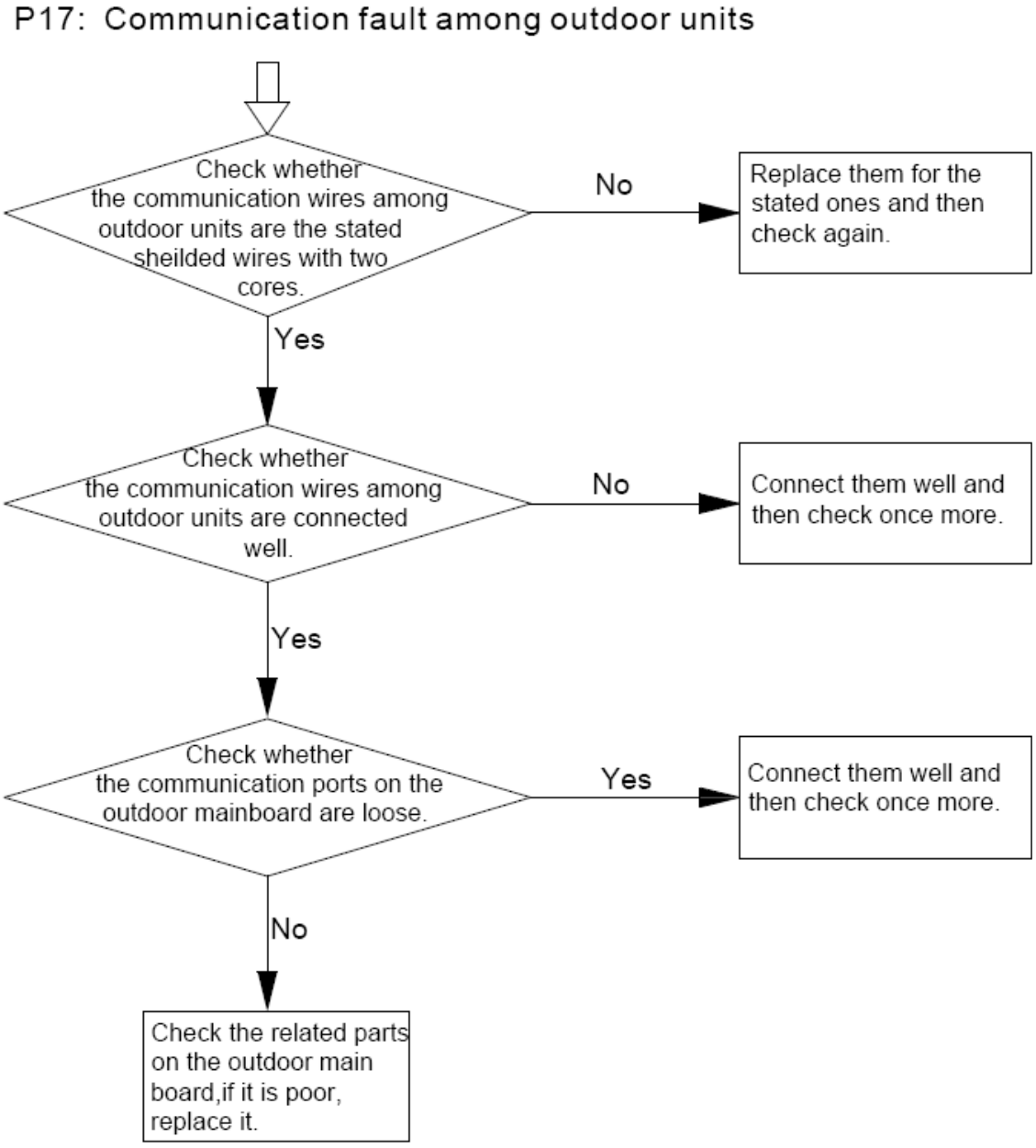
P17: Communication fault among outdoor units

Causes:

When the communication wires among outdoor units are connected wrong or some wires are not connected well, it will lead the communication among them go wrong and the system electric control will display P17 to clue to users.

Troubleshooting:

Please carry on maintaining following the flow below:


P17: Communication fault among outdoor units
Check whether the communication wires among outdoor units are the stated sheilded wires with two cores.
No
Replace them for the stated ones and then check again.
Yes
Check whether the communication wires among outdoor units are connected well.
No
Connect them well and then check once more.
Yes
Check whether the communication ports on the outdoor mainboard are loose.
Yes
Connect them well and then check once more.
No
Check the related parts on the outdoor main board,if it is poor, replace it.

19) P18: The current input of #1 Fixed-frequency compressor is so large that the compressor breaks down

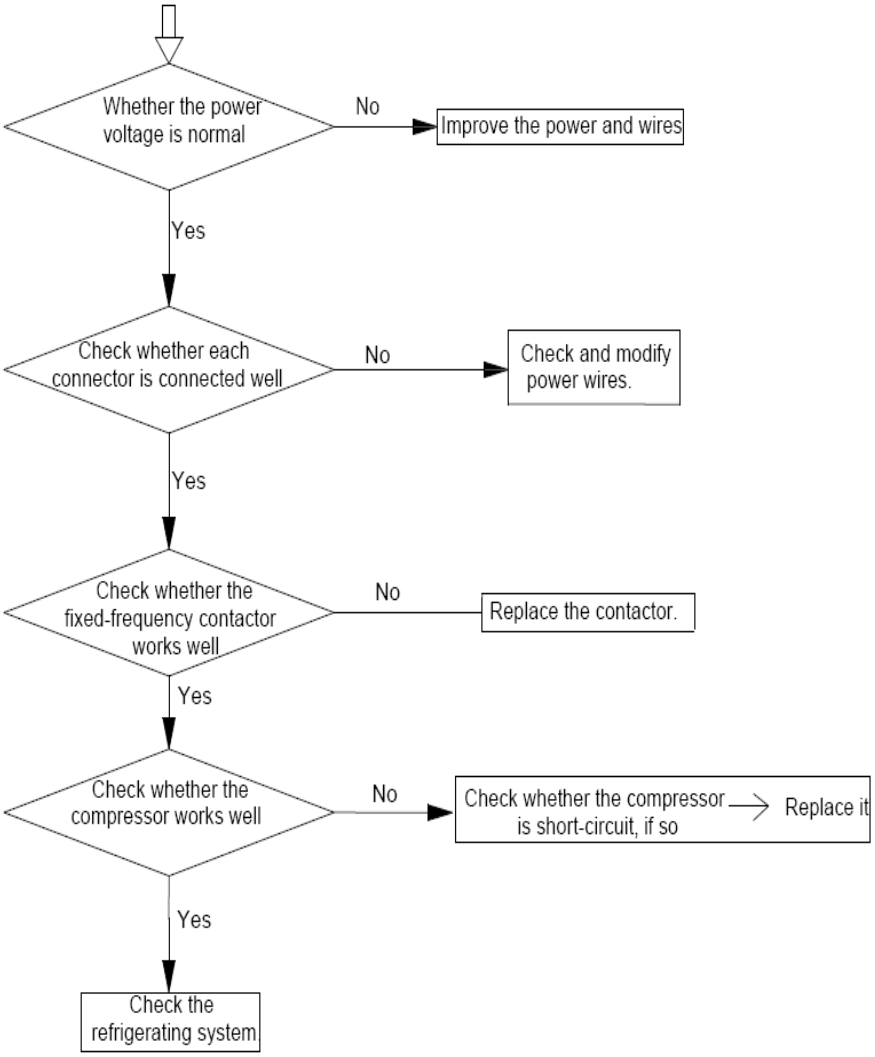
P21: The current input of #2 Fixed-frequency compressor is so large that the compressor breaks down

Causes:

As for DC Inverter VRF system, the electric control is kept inspecting the operating current of the compressor, when the current surpasses the setting value, the system electronic control will display the corresponding code and stop the compressor. As for the setting value, it is depended on the type of compressor.

Troubleshooting:

Please carry on maintaining following the flow below:



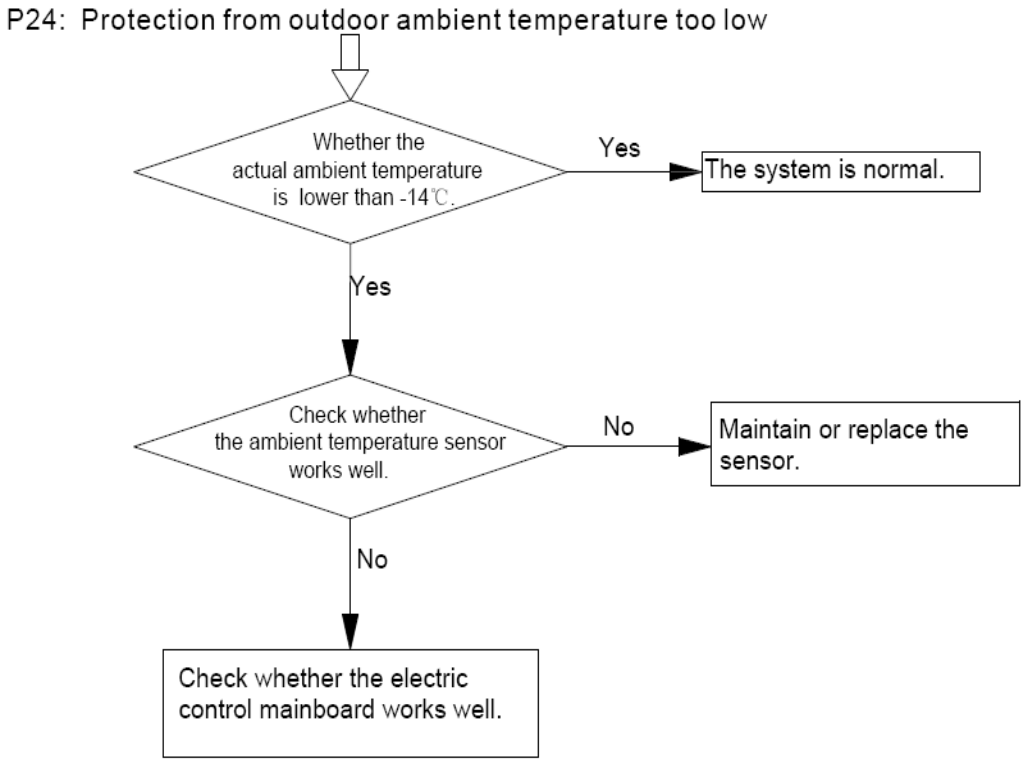
20) P24: Protection from outdoor ambient temperature too low

Causes:

As for Super DC Inverter Module Unit, the electric control system is kept inspecting the outdoor ambient temperature, when the temperature is lower than -14 , the electric control system will forbid the unit to run and clue the unit enters to the protection state.

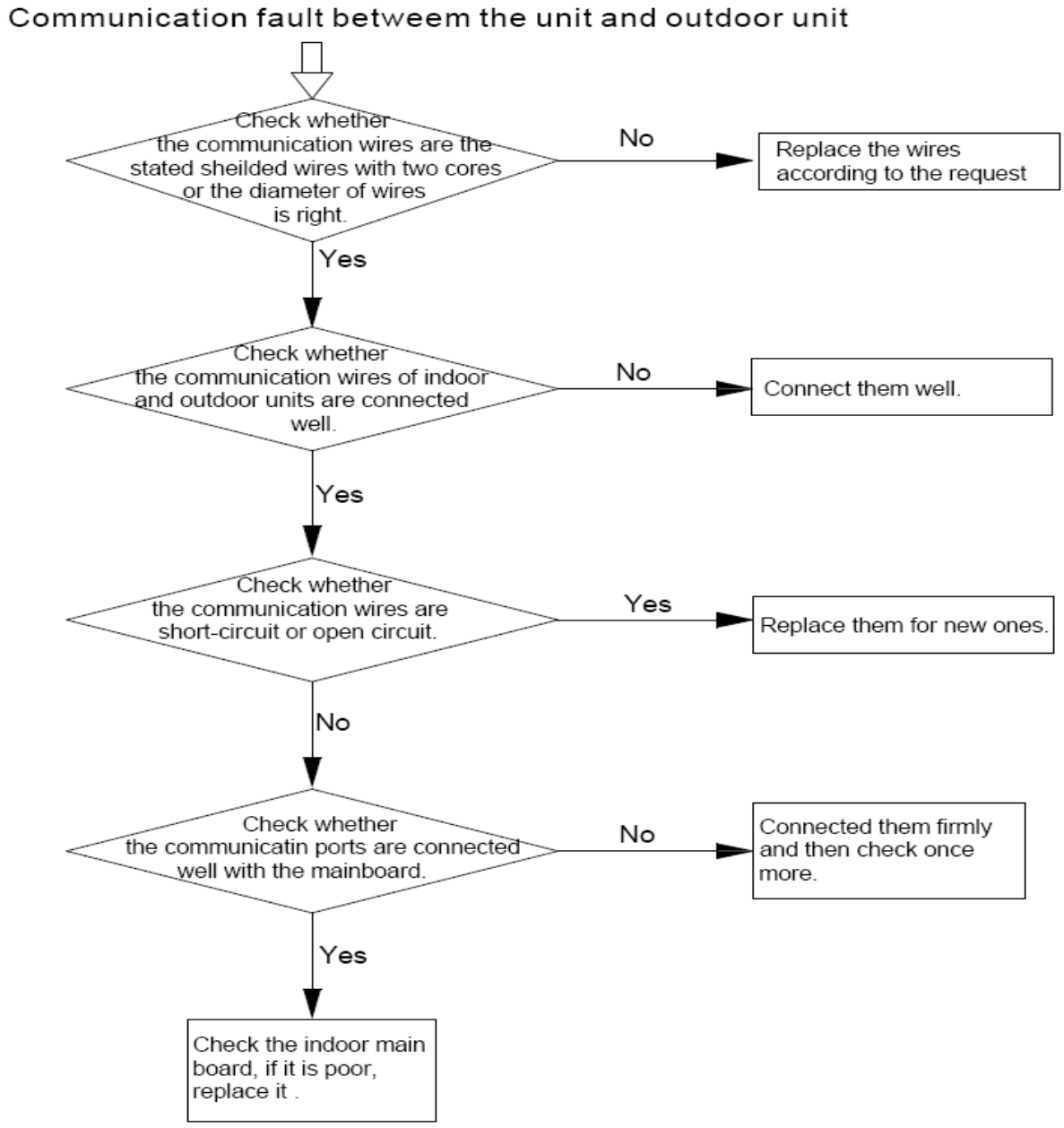
Troubleshooting:

Please carry on maintaining following the flow below:

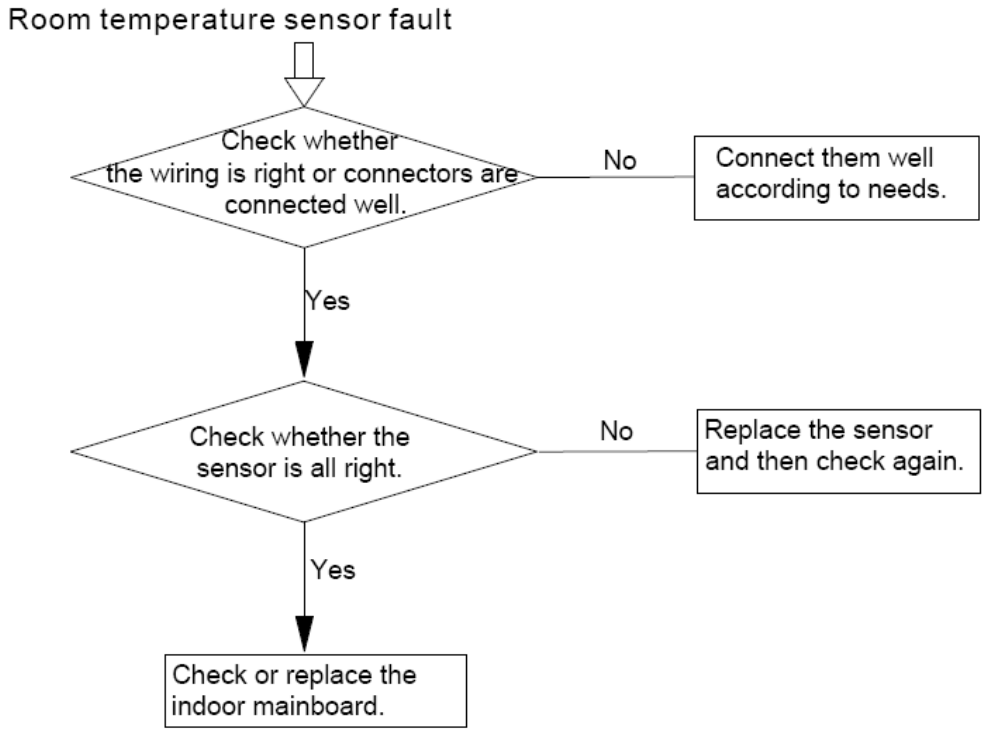

P24: Protection from outdoor ambient temperature too low
Whether the actual ambient temperature is lower than -14℃.
Yes
The system is normal.
Yes
Check whether the ambient temperature sensor works well.
No
Maintain or replace the sensor.
No
Check whether the electric control mainboard works well.

2.2. Indoor unit

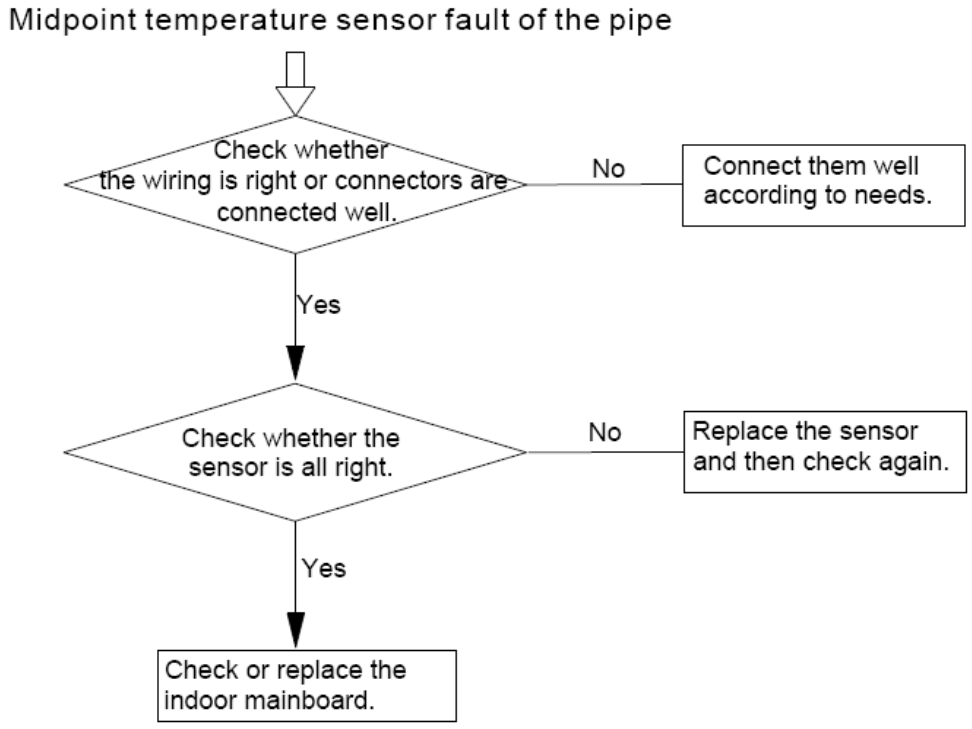
1) Communication fault between the unit and outdoor unit, the troubleshooting is referred to the flow below


Communication fault betweem the unit and outdoor unit
Check whether the communication wires are the stated sheilded wires with two cores or the diameter of wires is right.
No
Replace the wires according to the request
Yes
Check whether the communication wires of indoor and outdoor units are connected well.
No
Connect them well.
Yes
Check whether the communication wires are short-circuit or open circuit.
Yes
Replace them for new ones.
No
Check whether the communicatin ports are connected well with the mainboard.
No
Connected them firmly and then check once more.
Yes
Check the indoor main board, if it is poor, replace it .

2) Room temperature sensor fault, the troubleshooting is referred to the flow below


Room temperature sensor fault
Check whether the wiring is right or connectors are connected well.
No
Connect them well according to needs.
Yes
Check whether the sensor is all right.
No
Replace the sensor and then check again.
Yes
Check or replace the indoor mainboard.

3) Midpoint temperature sensor fault of the pipe, the troubleshooting is referred to the flow below


Midpoint temperature sensor fault of the pipe
Check whether the wiring is right or connectors are connected well.
No
Connect them well according to needs.
Yes
Check whether the sensor is all right.
No
Replace the sensor and then check again.
Yes
Check or replace the indoor mainboard.

4) Outdoor unit fault

Troubleshooting:

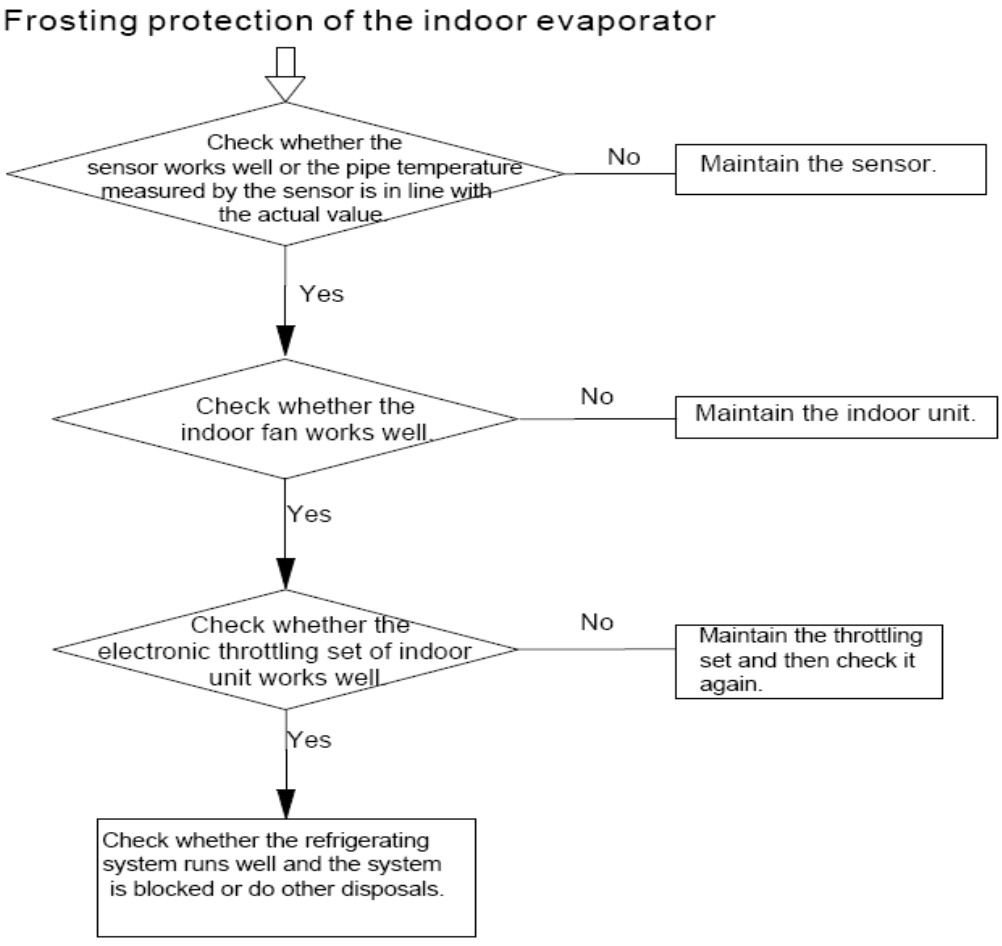
When the indoor unit clue that the outdoor unit goes wrong, it will stop the outdoor unit running and then inspect and maintain it according to the hint of the outdoor electric control.

5) Frosting protection of the indoor evaporator

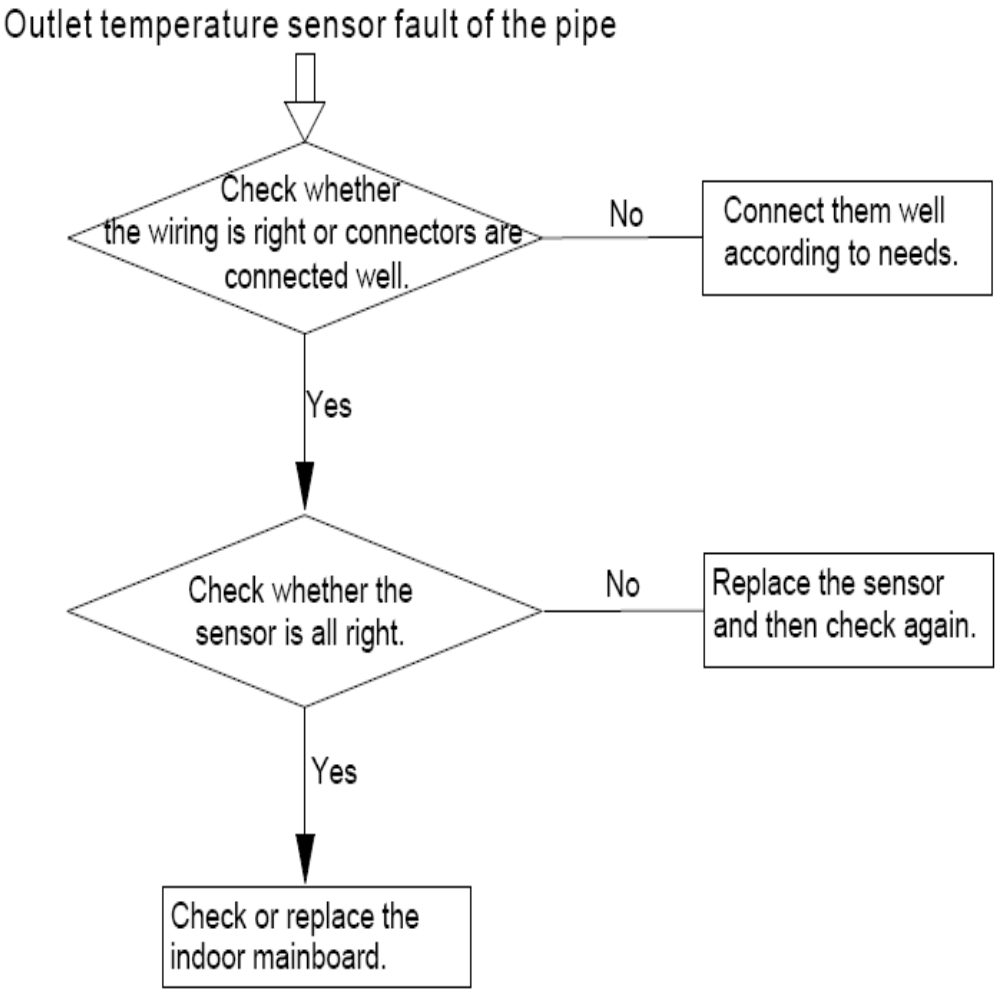
Causes: When the indoor electric control inspects that the temperature in the middle of the evaporator keeps lower than 2 for 3 minutes, it will clue that the evaporator begins to frost for protection and stop the indoor unit running to prevent the indoor unit from frosting.

During frosting protection, when the coil temperature of the evaporator is no lower than7 , the electric control will unlock the protection and restart up the indoor unit.

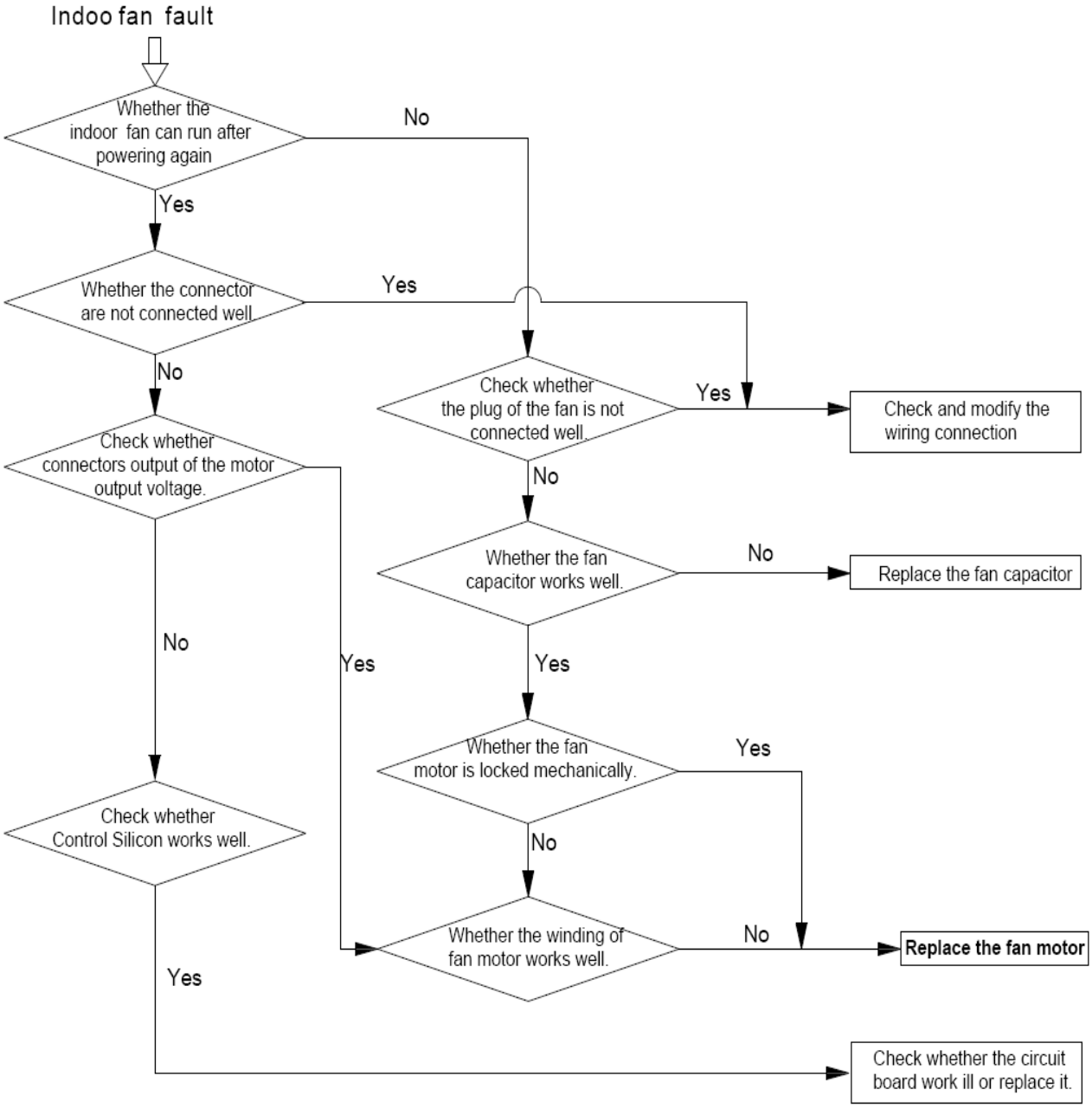
The troubleshooting is referred to the flow below:


Frosting protection of the indoor evaporator
Check whether the sensor works well or the pipe temperature measured by the sensor is in line with the actual value.
No
Maintain the sensor.
Yes
Check whether the indoor fan works well.
No
Maintain the indoor unit.
Yes
Check whether the electronic throttling set of indoor unit works well.
No
Maintain the throttling set and then check it again.
Yes
Check whether the refrigerating system runs well and the system is blocked or do other disposals.

6) Outlet temperature sensor fault of the pipe, the troubleshooting is referred to the flow below


Outlet temperature sensor fault of the pipe
Check whether the wiring is right or connectors are connected well.
No
Connect them well according to needs.
Yes
Check whether the sensor is all right.
No
Replace the sensor and then check again.
Yes
Check or replace the indoor mainboard.

7) Indoor fan fault, the troubleshooting is referred to the flow below (it is applicable for the case that the indoor motor is PG motor):



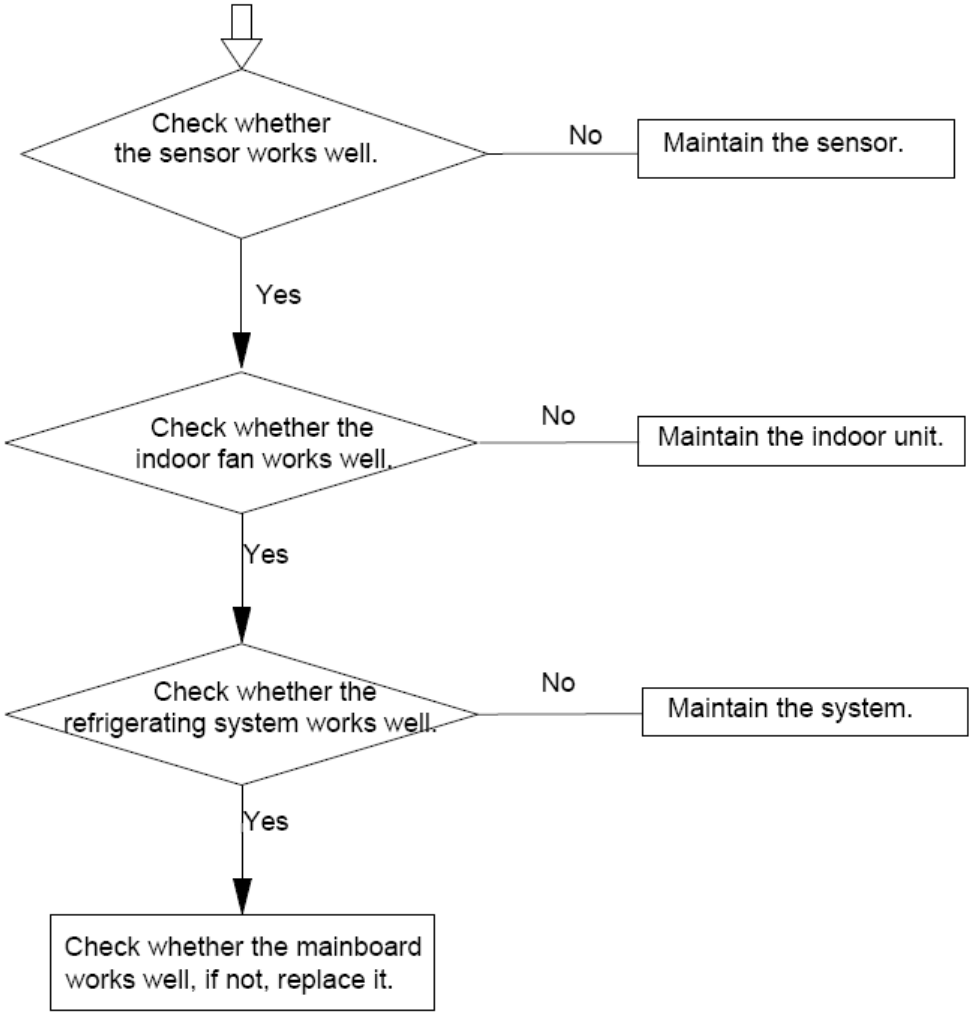
8) Protection from too high the midpoint temperature of the pipe in heating mode

Causes:

When the indoor electric control inspects that the temperature in the middle of the evaporator keeps no lower than 62℃ in heating mode, it will clue to entering protection from too high the midpoint temperature of the pipe and when the coil temperature of the evaporator is no higher than 52℃, the electric control will unlock the protection.

The troubleshooting is referred to the flow below:

Protection from too high the midpoint temperature of the pipe in heating mode

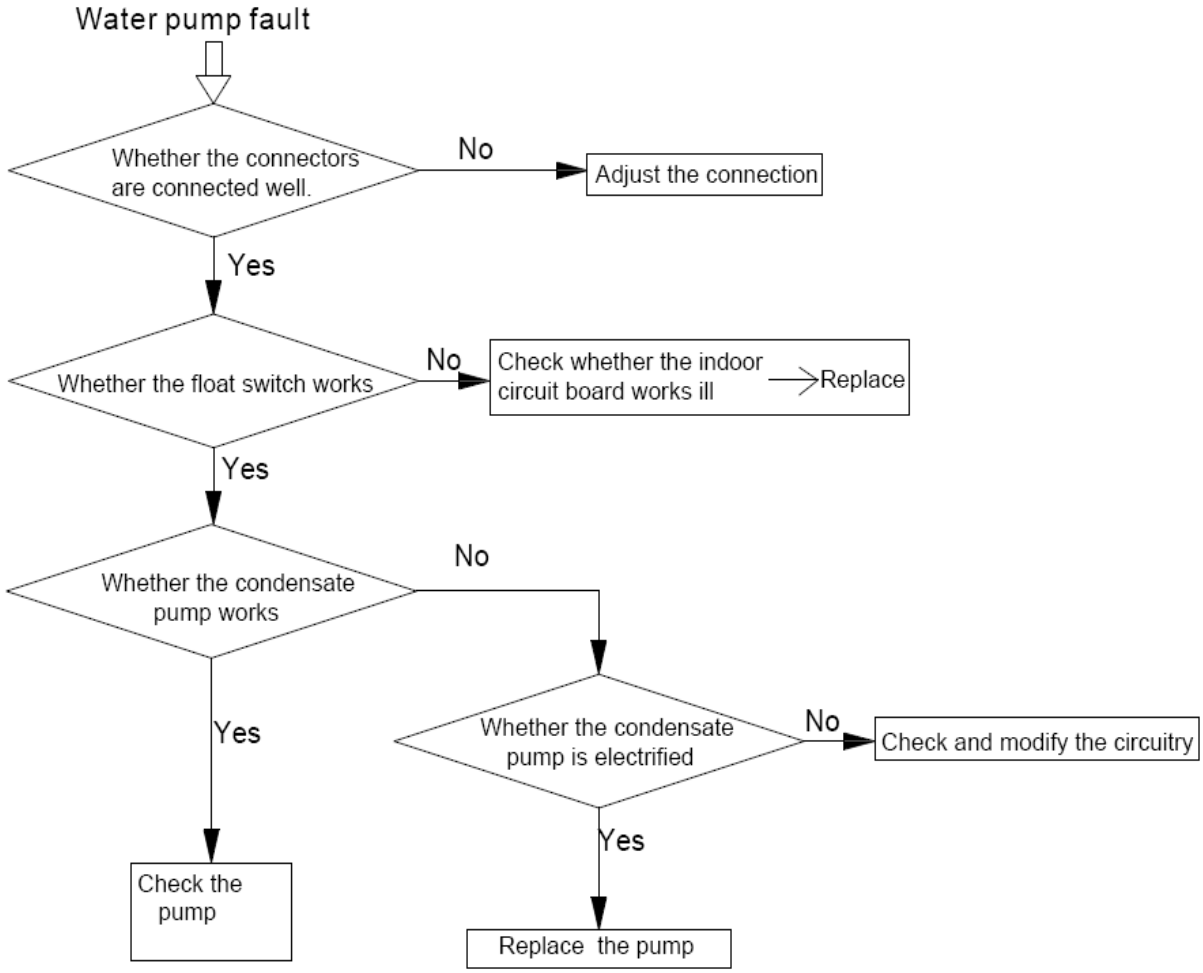


9) Water pump fault

Causes:

In cooling mode, when the indoor electric control inspects that the water level switch keeps in off-position for 5 minutes, the electric control will display the fault and shut down the unit. The unit will be restarted up after the fault is eliminated.

The troubleshooting is referred to the flow below:



Part 7
Indoor Electrical Wiring Diagram

1. Application unit: Low ESP, middle ESP, high ESP duct.....126

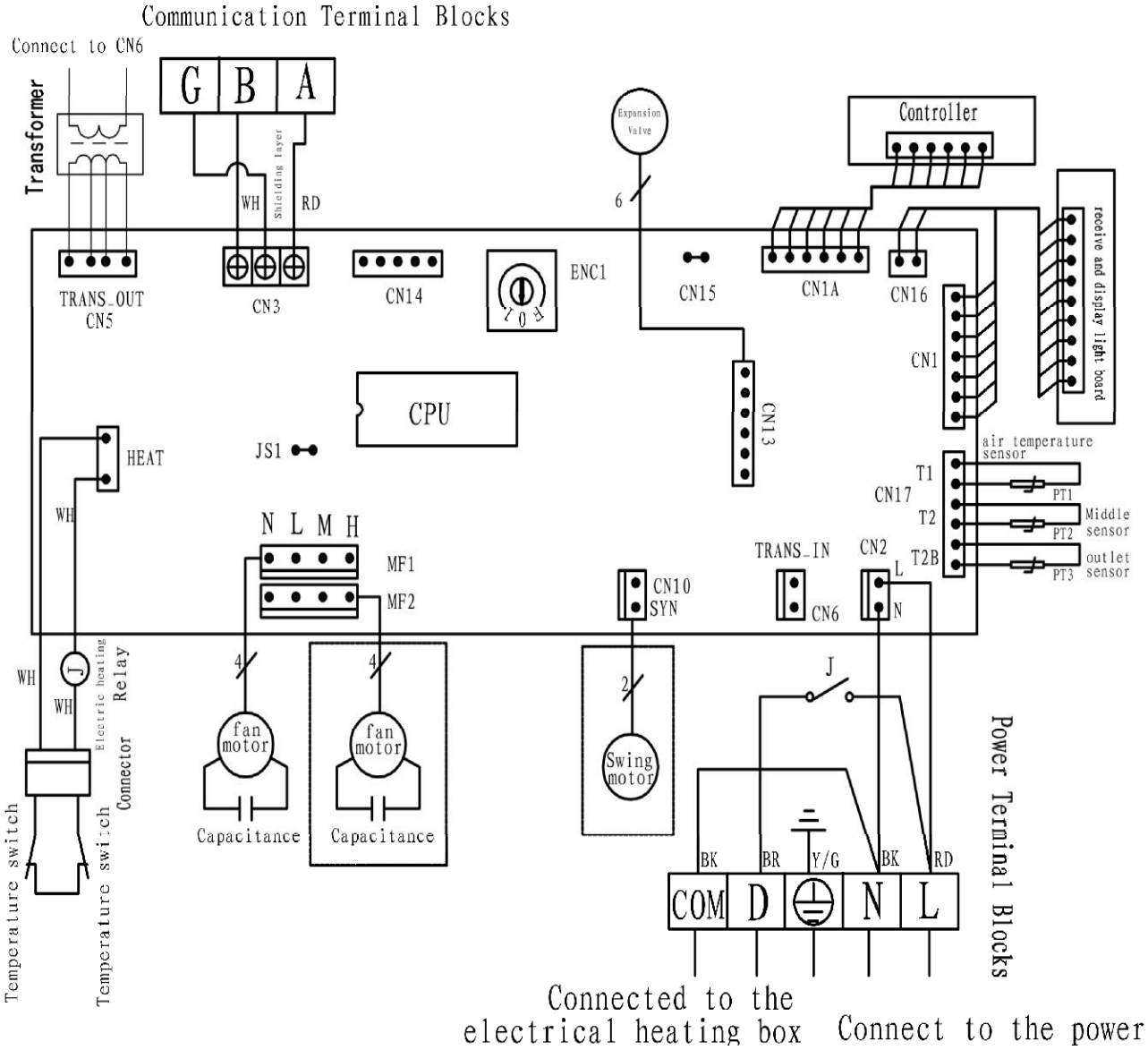
2. Application unit: Wall-mounted.....128

3. Application unit: Wall-mounted.....130

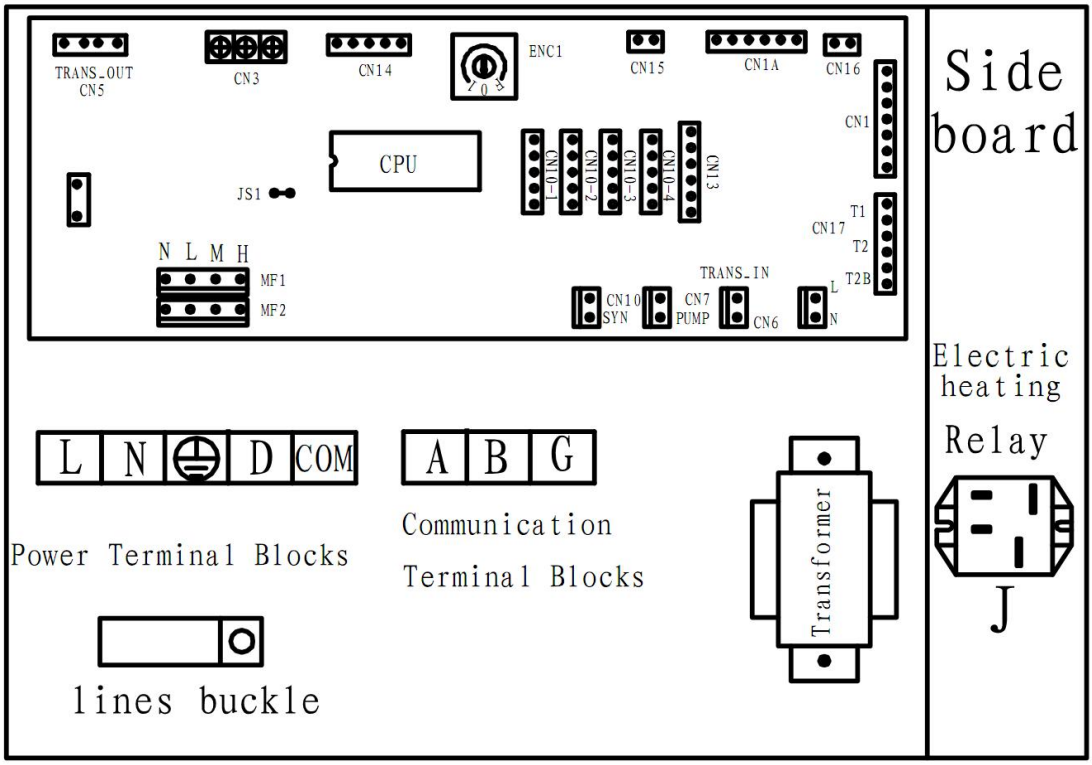
4. Application unit: Floor & Ceiling.....132

1. Application unit: Low ESP, middle ESP, high ESP duct

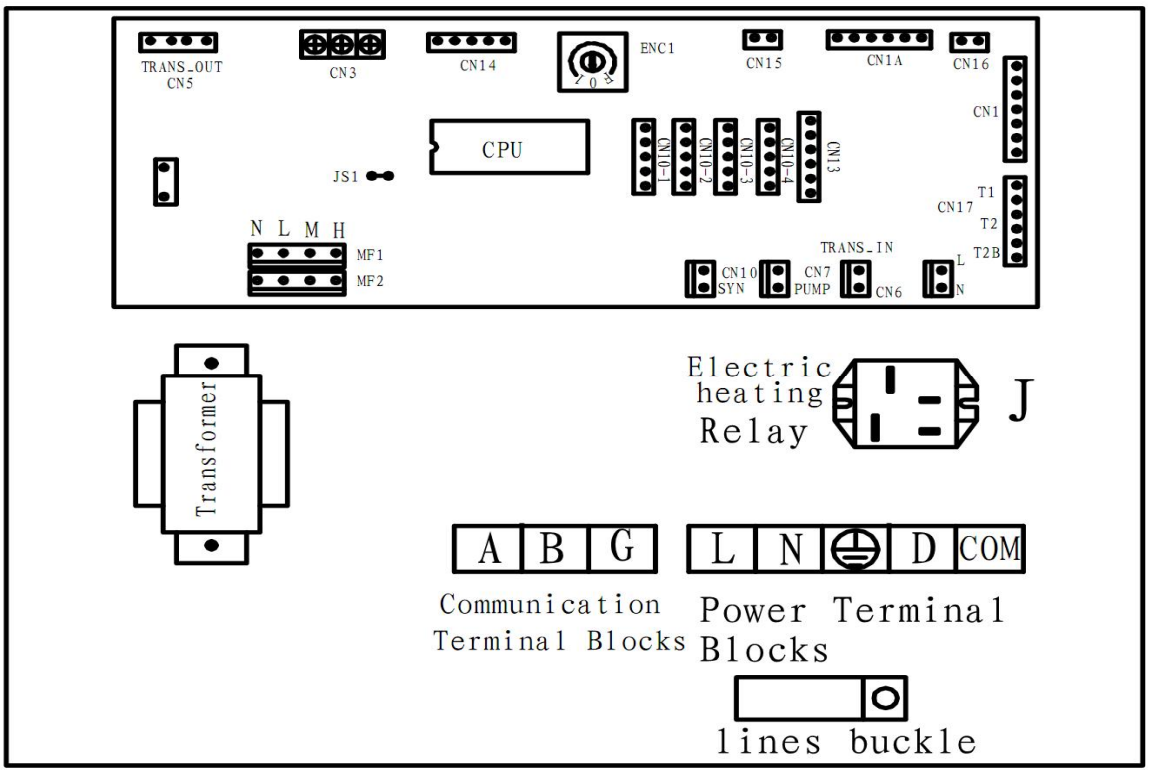
Electrical wiring diagram



Low ESP duct – electrical components layout



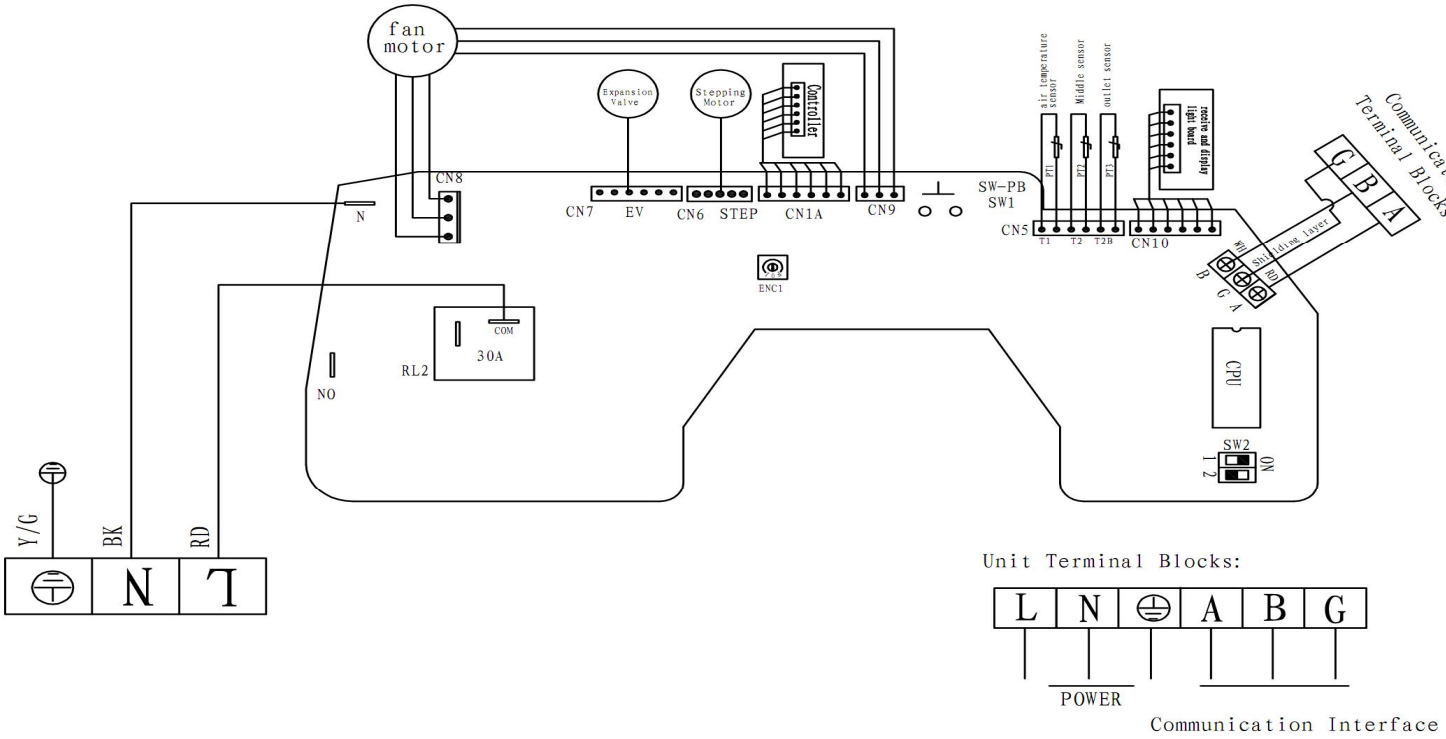
Middle & high ESP duct – electrical components layout



2.Application unit: Wall-mounted

2.1 Application unit: CMV-22G (V84), CMV-28G (V84) , CMV-36G(M84)

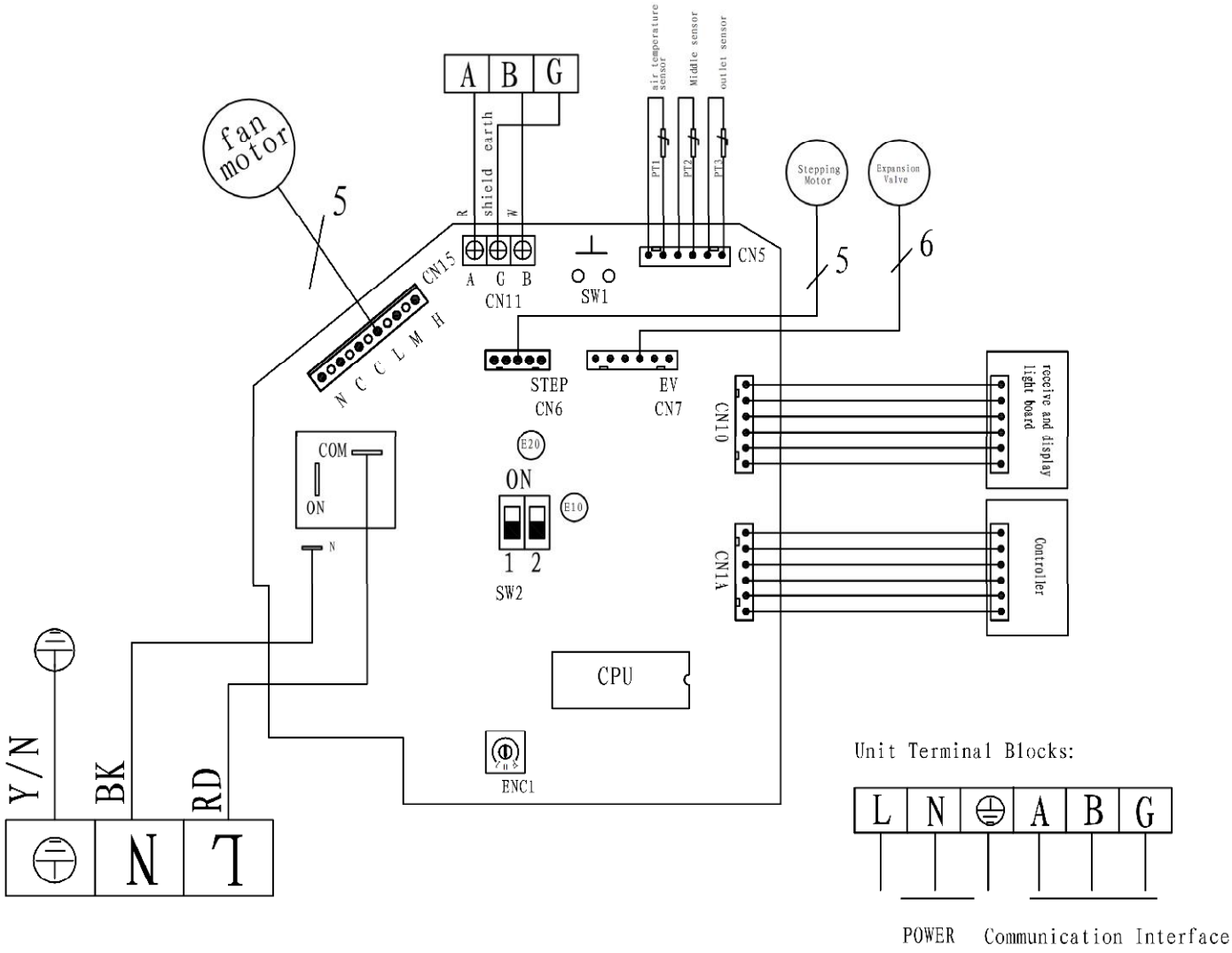
Electrical wiring diagram



Remark: 1, About the use of the "SW2" switch. The "1" key stoke must be set "ON" station, the "2" key stoke must be set "OFF" station

2.2 Application unit: CMV-45G (P84), CMV-51G(P84), CMV-70G(W84)

Electrical wiring diagram



Remark: About the use of the "SW2" switch

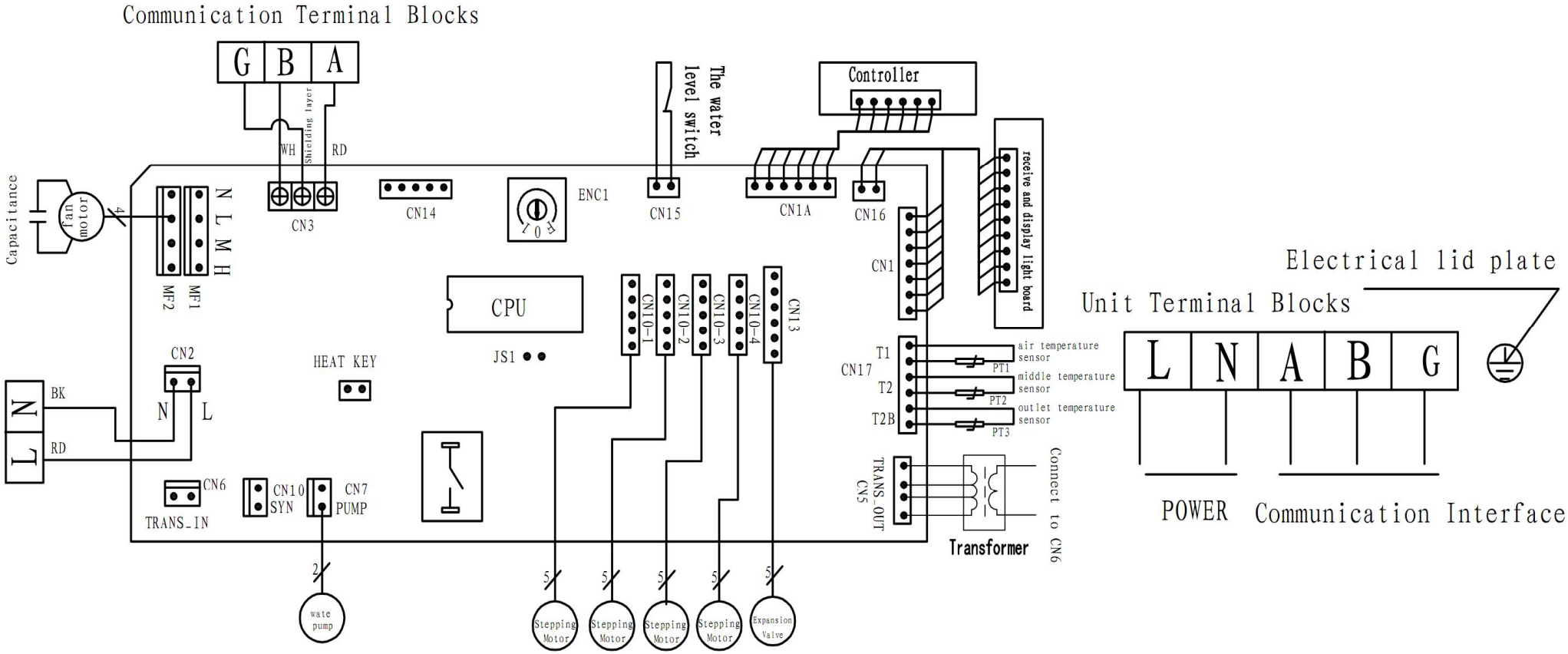
The "1" key stoke must be set "ON" station

The "2" key stoke must be set "OFF" station

3.Application unit: Wall-mounted

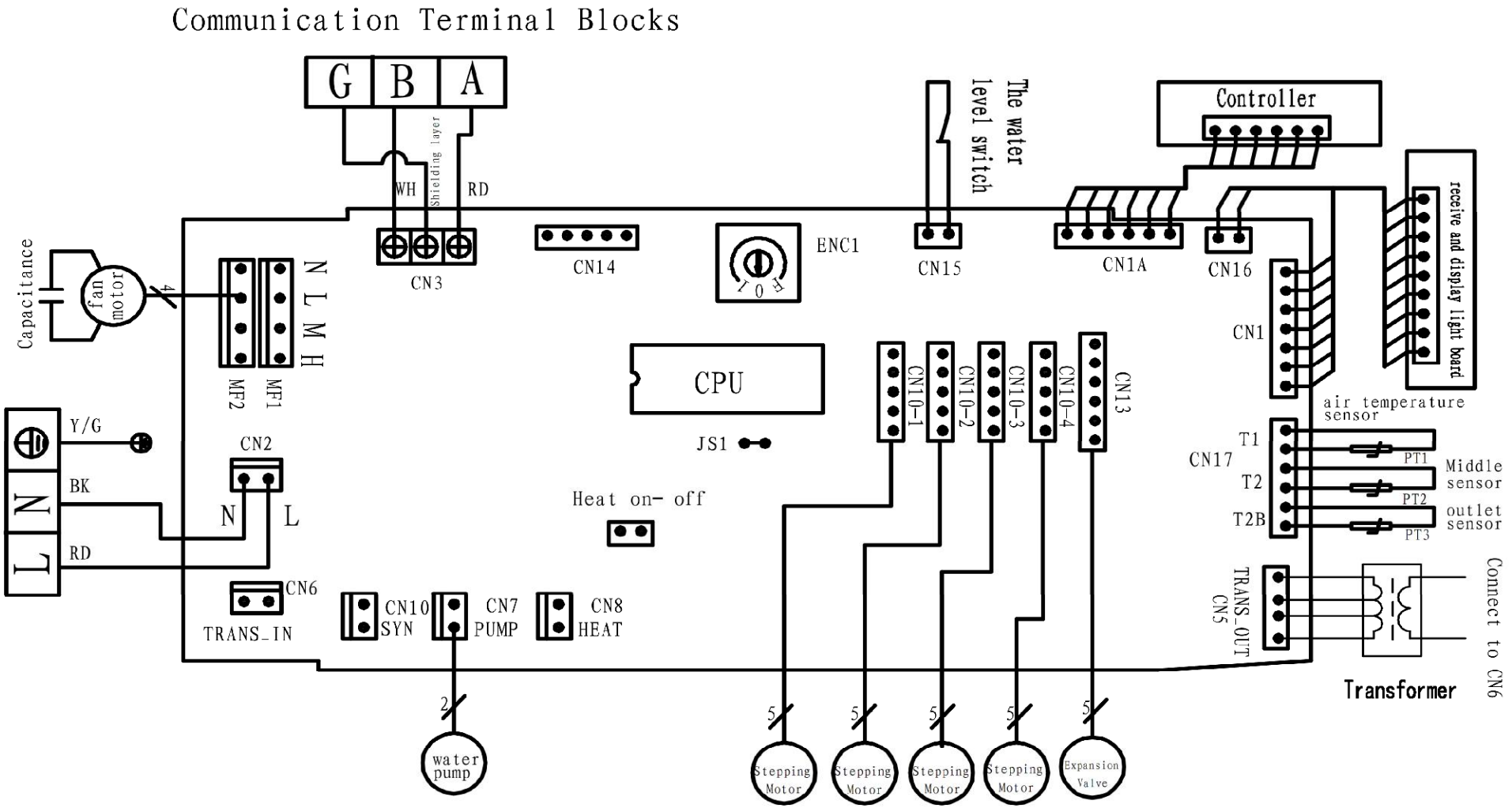
3.1. Application unit: CMV-22Q, CMV-28Q, CMV-36Q, CMV-45Q, CMV-56Q

Electrical wiring diagram



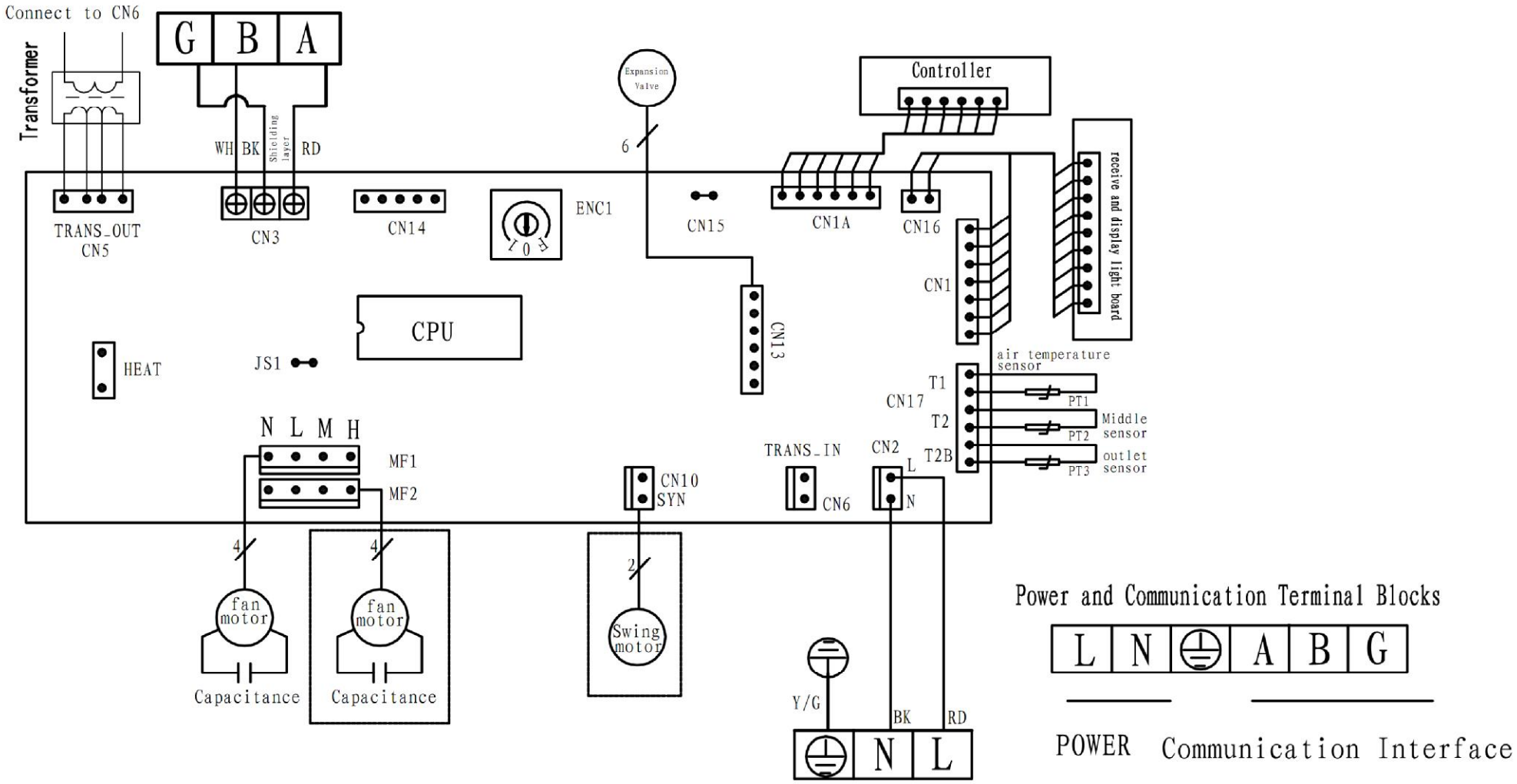
3.2. Application unit: CMV-71Q, CMV-80Q, CMV-100Q, CMV-112Q, CMV-125Q, CMV-140Q

Electrical wiring diagram



4.Application unit: Floor & Ceiling

Electrical wiring diagram



Indoor electrical wiring diagram